Machine Tool BLUE BOOK

FOUNDED

OCTOBER 1937

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- Cuts Hard Steel
- Individually Tested



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SIMONDS RED TANG

THE FILE WITH THE METAL SAW TOOT!

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PUBLISHED AT 508 SO. DEARBORN ST., CHICAG

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For the that wants paced when the transfer of the that wants it was to be the that wants w

number 4-B out-cuts all others



ARMSTRONG-BLUM MFG. CO. 'The Hack Saw People " CHICAGO, U.S. A.

341 N. Francisco Ave.



LESS WELDON



You'll See the Difference

Weldon Cupped-End Mill

This new mill embodies the following desirable features:

- Stronger, because of scientifically controlled heat treatment.
- Faster, because of improved flute design.
 Take full advantage of shear-cutting action.
- 3. Costs Less, Let our representative show you why. May we send him?

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WELDON TOOL CO.

"PIONEERS IN FAST SPIRAL DOUBLE-END, END MILLS 321 FRANKFORT AVE CLEVELAND, OHIO

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For the shop that wants speed when it's sawing and wants it at a pice, there is no sawing machine like the MARVEL No. 4B.

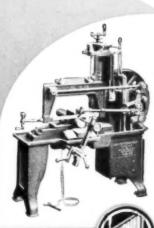
Fast, straight-cutting, accurate, it will out-cut any hack saw in its price class. will stand up and give years of service on ordinary shop sawing.

No. 4B capacity 6*s6*. Equipped with swivel vise, automatic stop, adjustable end gauge, belt or motor drive, both power and hand strew leeds, quick return on non-cutting stroke; and blade automatically raises above work at completion of a cut.

For continuous production sawing, we recommend the Heavy-Dury, all ball bearing MARVILL Saws Nos 6, 6A, 9, or 9A (Capacities to 10⁸x 10⁸) with or without automatic bar push up.

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CAPACITY 6"x6"



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"The Hack Saw People"
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WITH FAST CUTTING



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AND



Turn

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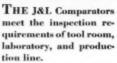
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They may be used to compare objects against a master outline, or to make direct measurements of height or depth



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about company purc he knows his lathes and inside-out. Even hard-hoiled Bill admits that "What Makes Main Street," not only gave him a better conception of his job . but an entirely new "lathe's-ey view of his own particular nic in the parade of production.

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 Nothing is more disheartening to a skilled mechanic than to try to produce precision work on wobbly, worn-out, or obsolete drill presses.

If you want your MEN to be proud of their work, give them these modern, high-speed, easy-to-operate "Buffalo" No. 14 Sensitive Drills. Spoilsage will be much less, work will be accurate, production will be better.

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DRILL

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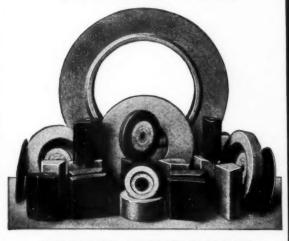




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525 pieces per hour
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PRODUCTION STEPPED UP 84%

By the old method: A 35 pound fixture . . . excess handling . . . unnecessary operator's fatigue. By the *Haskins* Method: A three pound fixture . . . no extra handling . . . no clamps . . . a new high tapping speed . . . fatigue reduced.

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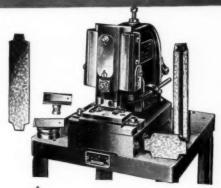
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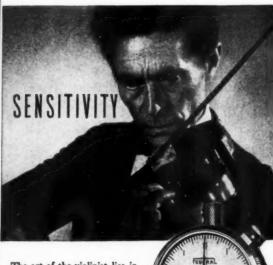
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An indispensable tool for your production drilling and tapping machines.

Special Jaws and Bushing Plates enable you to handle almost any operation on these Jigs at 25% of your ordinary tooling cost.

OUICK LOADING, PERFECT VISIBILITY AND PLENTY OF CHIP ROOM INCREASES YOUR PRODUCTION.

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The E-1C Rotor Drill has a world of power for %" drilling at 1200 R. P. M., is light in weight and easy to handle.

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Here's the clutch mechanism for one-revolution and stop. Meets the requirements of clutch users who supply their own drive members. The Conway K O Clutch is also furnished with conventional extended sleeve.

Send for Bulletin K-32 giving full information on Conway One-Revolution Clutches.

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NOPAK

3 and 4-Way Operating Valves

FOR AIR, WATER AND OI



3 and 4-Way Foot Operated



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Sturdy yet simple in construction, NOPAK Operating Valves offer ong, efficient operation without maintenance cost, and with absoute freedom from leakage.

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MODERN" SPRING COLLETS
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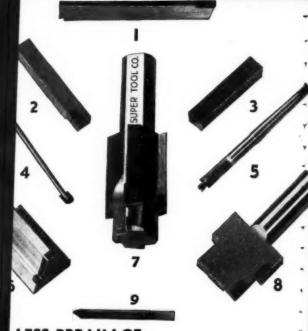
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REBUILDING OF SCREW MACHINES

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Less breakage . . . more production . . . greater economy . . . are these things important to you?

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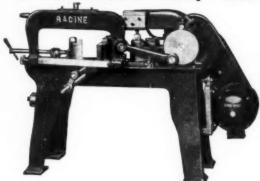


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SIMPLIFIED HYDRAULIC FEED-MODERN DESIGN

A machine for the small shop or as auxiliary equipment in the large shop. The price is very moderate. Here is an ideal 6°x6° machine that has everything—

Accuracy in cutting Modern simple lines Freedom from complications Long blade life Rapidity in production (2 to 3 square inches per misse)

The hydraulic principle, simplified and engineered by pioneers in the application of hydraulics to metal cutting machines.

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(Also hydraulic feed heavy duty machines, 10x10°, 12x12°, 10x16° and 13x16° capacities.)
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(RACINE Duplex Band Saws, 14°-for Metal-Cutting, Tool Room, Pattern Shops and General Shop Work.)

"STANDARD THE WORLD OVER"

RACINE TOOL & MACHINE COMPANY



Built for EXCEPTIONAL SERVICE

ROCKFORD

INCLINABLE
AND
STRAIGHT SIDE
PRESSES

in all

THE ever increasing use of heavy sheet metal stampings nowadays in place of castings and the numerous parts formerly made on screw machines, requires presses of greater power and capacity, and that's just what you get in the ROCKFORD.

Rockford Presses are sturdily built of the best materials and incorporate many features that are the result of years of experience in building presses of various types. You can depend upon a Rockford—for it is designed to maintain exact adjustment throughout long runs and under heavy duty.

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GUARANTEED To Save Its Cost in Labor Every Six Months

To save time with quicker and more accurate set-ups in your shop, install a Modern "Combination." It's safer and easier to use, handles difficult jobs without blocks, clamps or awkward plates and helps to prevent accidents by eliminating dangerous holding by hand. Manufactured in models to fit every drill press. Write today for complete information on the "Combination" and our 30-day trial, giving dimensions of the table you wish to replace.

30-DAY FREE TRIAL

Costs you nothing. If you are not satisfied in 30 days, we will pay the freight both ways.

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Manufacturers of the "Modern" Cutting-Off Machine

TTTEK AUTOMATIC Roll Feeds

For Every Size and Make of Punch Press



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Prevent Punch Press Accidents

One sudden accident may wreck a year's profits on a particular machine. Protect yourself and your operators by installing W tiek Automatic Roll Feeds. They feed automatically any stock from coils in lengths from 0" to

248 per press stroke and increase production at a saving in time, operating costs and dies. Single roll, double roll and compound type with straightener are easily installed on any make of punch press without alteration.

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No. 3 for 300-lb.

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KRW Hydraulic and Sensitive ARBOR PRESSES

New Improvements, Special Built-in Features and Lower Prices make them an outstanding value.

HE last word in convenience, efficiency and ease of operation, Built extra strong and well braced, with steel trusses electrically welded, these presses will withstand strains that would cause presses of lighter and inferior construction to buckle or collapse.

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Hand wheel for sensitive press operations has sliding handles which pull out to the ends for increased leverage. Work does not have to be changed from the work table as is the case with other make presses having a separa'e sensitive press unit mounted on the side or elsewhere.

The importance of this KRW feature as a time and labor saver can be appreciated. Also there is NO EXTRA CHARGE for this important built in feature on a KRW Press. Work table can be raised easily with one hand. A strictly one-man Press.

Write for special circular, just off the press, giving full details and specifications of all KRW Arbor Presses.



No. 37F-70 ton Hydraulic and Sensitive Arbor Press........... 300.00 Gauge and fittings, \$15.00 extra on all presses.

K. R. WILSON

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FASTER MORE POWERFUL

MODEL 2

A MASTER SHOP TOOL

An entirely NEW electric motor-inhand tool that puts brains at your

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Too: Universal Stand \$4.50 Bottom: Shaping Table \$2.50

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Exclusive refinements include - integral finger grip close to the chuck-self-releasing chuck lock — convenient snap switch — air cleaner with removable screen and a practical hanger. Sturdy construction. Powerful—about 27,000 r. p. m. Runs cool. Plugs into any A. C. or D. C. socket. Weighs 13 oz.

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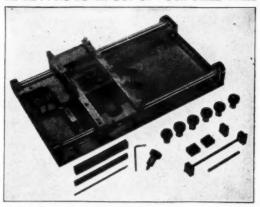
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10 DAYS' FREE TRIAL ON THIS MODEL Standard model, capacity 14x8x2 inches. 10-Days' Free Trial on this Model Only.

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The Pumps of well balanced design and construction. They can be mounted in any position and perform to perfection.

Regardless of grit and chips centrifugal pumping action insures dependable flow of cooling solution at all times.



Specifications: Choice of either 14.1/3.1/p.34. H. P. splash proof motor with enclosed ball bearings. For standard voltage or current. Pumps deliver from 25 to 70 gal. per minute at 10 ft. head. Cast iron body with bronze impeller. Either straight or priming cover. Spring tension packing. No bearings in pump.

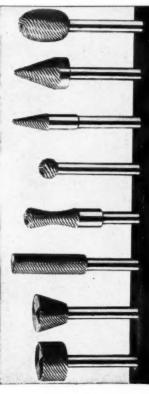
FOR FULL INFORMATION WRITE "DEPT. A"

SPECIALTIES CO., FULFLO

FORD HAND GUT



ROTARY FILES



Just a few of the many standard shapes which are carried in stock Send Quickmail Coupon No. 83 for full information

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M. A. FORD MFG. CO.

DAVENPORT, IOWA

OUR NEW GENERAL

Your copy of the new GITS lubricating equipment catalog,



illustrating and describing many new features, is now ready for mailing. Over 1,000 styles and sizes of oil cups, including oil and grease seals, oil cans, gauges, etc. are shown.

oil cups

grease seals

oil cans

gauges

Send Quickmail Coupon No. 80 for your copy.

GITS BROS. MFG. CO.

1860 S. Kilbourn Ave. Chicago, Illinois

44

Machine Tool BLUE BOOK

Selected Circulation 25,000 Monthly

OCTOBER, 1937

THIRTY-SECOND YEAR

An Upward Curve In August

The three-month recession in Machine Tool Orders was halted in August with the Index rising to 179.8. Any anxiety over the decline from the April peak should be dispelled by the 12% rise in domestic business over the July total.

At some points, deliveries are still something of a problem because of the exceptional Spring spurt. Buying on the part of the larger factors is reported as better than expected, although some of the smaller users have been holding off.

Generally, it is believed that business will stabilize as soon as the commodity and stock markets stabilize. We seem to be at a point in the recovery cycle from which in our previous history there never has been a serious reaction. The public is spending and is supplied with funds. Most of the farmers have had a good year. There is no evidence of overproduction and inventories reflect normal rather than boom times. It would seem that only a world cataclysm could prevent a broad business expansion during the next year or two.

Published By

Hitchcock Publishing Co.
508 S. Dearborn St., Chicago, III.

Consult the Classified Finding Index for your requirements

Electroforming Molds for the Plastic and Rubber Industries

Fabrication of dies and molds by the electrical transfer of copper made the phonograph industry

possible.

Production of dies in iron and iron alloys is not new. Dies for bank notes were formed by such a process in old Russia and in Vienna. The Russian process was sensitive, laborious and slow—a labora-

tory curiosity rather than a production tool.

Fundamentals necessary for the deposition of a high quality iron at a relatively high rate were discovered, it is asserted, some two years ago by J. Gilbert Malone, Sc. D. Since then, the process has been applied to the production of molds and dies for the rubber, plastic and die casting industries. Tire molds probably offer the greatest single field at the present time, due to the volume. However, from the standpoint of savings effected per unit of manufactured article, it would seem the plastic industry stands to benefit most by this development.



As evident from the illustration, these dies may appear like a straight engraved and machined job. Their construction is such, however, that the engraving is contained in the electroformed face which may

DO IT-

Better—Faster—for Less! with ODIN UNIVERSAL

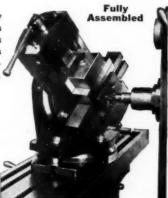
Precision Vises
Swivel and Plain

with Interchangeable Jaws and Hardened and Ground Parallels

They quickly pay their costs in savings on High Tool Costs —Expensive Fixtures —Patterns and castings—Extra Set-Ups.

> Investigate the money saving possibilities of ODIN VISES

Send Quickmail Coupon No. 71 for full facts and prices.



Let us show you how to make cheaper and better jigs and fixtures at a greatly reduced cost—with a great saving in time.

ODIN UNIVERSAL

Sales Division 110 S. Dearborn St., Telephone Franklin 3281 be as thick as necessary for the use of the mold. The thinner the electroformed face, the lower the cost, particularly in the time required to produce it in the bath. A $\frac{1}{16}$ inch shell may take 24 hours while the $\frac{2}{16}$ inch takes 72 hours of forming time.

This shell is backed up with molten metal or welded to a steel plate and machined to give the external dimensions required. It is obvious that the greatest advantage of the method is in cases where the mold cavity would require the greatest amount of work in the older practice. Thus, any amount of intricate engraving is easily transferred. On the other hand, it has no point of preference where the cavity can be made by a few operations on a lathe or boring mill. It is said that the electroformed shell can be welded with a surprisingly small amount of distortion.

The whole process is a method of reproducing and a master must be constructed by some other process. This master model may be made of any imaginable material, such as modelling clay, plaster, rubber, wood, metal, etc. The natural surfaces of wood, leather, etc., can be faithfully reproduced. Given the master model, a negative is reproduced by means of the soft, low-temperature-melting alloy Cerrobase produced by the Cerro de Pasco Copper Corp.

Upon the Cerrobase the working master is produced in iron by deposition, and is an exact suplicate of the master model, detail as fine as 7000 lines to the inch being reproduced. From this, any number of dies may be made.

As a matter of routine, an engraver should remove any imperfections from the working model, carried over from the master, and also it should be highly polished, a procedure best done on the iron rather than on the materials of the original master. The die will then have the high polish necessary for plastic work, and the final die may be hardened by suitable treatment. Allowing for delays, a schedule of ten days from master model to finished die may be maintained.

Mr. J. D. Trethaway may be addressed in care of the Cerro de Pasco Copper Corp., 44 Wall St. New York, for any desired information concerning this process. RILL HOLES IN TOUGHES



KILSAW SLOW-SPEET

ELECTRIC DRILLS

... save time, save twist drills, save tool maintenance costs!

Built especially for drilling in steels of high nickel content, as Monel and Allegheny metals, stainless steel, etc. These new SLOW-SPEED drills lengthen the life of twist drills, eliminating the need for frequent sharpening. Can't be stailed even at maximum drilling capacity!

Made in ¼ in. and ½ in. sizes,...in speeds of 350, 450, 600 or 750 R.P.M. The one-hand grip feature makes the ½ in. size ideal for use with hole saws in places hard to reach with side-handle drills. Test either of these drills on your toughest jobs and you'll never want any other kind!

See your Distributor or Send Quickmail Coupon No. 16 for Catalog.

SKILSAW, INC. 3304 Elston Ave., Chicag

\$14 E. 40th St. New York-52 Brookine Ave., Boston-1429 Spring Garden Philodelphia-312 Omer Ave., Los Angeles-2005 Webster St. Oakland

Doall Metalmaster Deep-Throat "MD"

Continental Machine Specialties, Inc., Minneapolis, Minn., offer a new Doall three-in-one contour machine with 30-inch throat capacity, designated as "MD." Like its companion model "M" a feature of this new unit is a built-in automatic instant butt-welder for the saws.

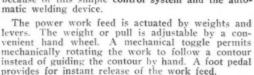
It is pointed out that narrow-blade saw welding requires a precision welding instrument to obtain the exact amount of current for each width of saw. A voltage regulator provides this so that every weld is made exactly uniform. Pressing one lever auto-

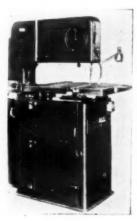
made exactly uniform, matically performs the entire butt-welding operation. It is said that the weld is completed instantly and the joint is stronger than the rest

of the saw.

Another helpful feature is dial control of cutting speeds. A speed indicator records the exact speed within the broad range from 40 to 800 feet per minute. A "job" selector dial translates the correct speed to use in sawing or filing 48 different materials, and it is asserted that an apprentice or new operator can produce the proper results with little or no training in contour machining.







ARMERIAN REGINUS. PAT. OFFICE ON G



are you Boondoggling in your Tool Room

The forging and grinding of bar tools is "made work" today for there

are ARMSTRONG TOOL HOLDERS for every operation on lathes, planers, alotters and shapers — efficient multipurpose tools that permit productive work on a moment's notice. To hold back men or machines for "tool dressing," to stall for deliveries of tool steel, to keep cutting speeds down "to 1926 levels" is frankly "boondoggling" that cannot be supported by competitive industries.

Where the object is profit, tooling-up should be—that of the Armstrong System—to the selection of a cutter and adjusting it for clearance. Unproductive machine hours are strictly limited, for additional ARMSTRONG TOOL HOLDERS are as available as the nearest mill supply house. Cutting speeds with ARMSTRONG TOOL HOLDERS and ARMSTRONG HIGH SPEED Cutters have advanced far beyond the "150 ft. per minute" of days gone by.

To cut cutting costs and build profit adopt the Armstrong System as your tool system and "Save; All Forging, 70% Grinding, 90% High Speed Steel" on every operation—on short runs, on long runs; on the heaviest work, on the most delicate. Send Quickmail Cospon No. 6 for catalog.



Armstrong Bros. Tool Co.

308 N. Francisco Ave., Chicago, U.S.A.
Eastern Warehouse & Sales: 199 Lafayette St., N. Y.
San Francisco,
London

The work table has a four-way tilt and a new type

of detachable disc cutting unit is furnished.

Work thickness capacity is 8 inches, although this model, as well as the smaller Metalmaster, is made on special order to cut up to 12-inch thickness capacity.

The entire base of this new machine is of arc welded construction, and the welded housing is seasoned before machining. This construction carries out the clean-styled appearance of the Doall, and is said to afford other advantages of welded construction.

The makers will gladly send you a bulletin illustrating and giving detailed information concerning the Metalmaster and the work for which it is especially

adapted.

Wodack Star Drill Retainer Is Called Great Improvement

In ordinary practice, holes are drilled in concrete, brick and stone with the electric hammer and star drill. The drill is not held tightly in the hammer, but fits loosely into a socket, so that the blows delivered by the hammer can rebound, like blows from a hand hammer. While this method of holding the star drill has its advantages, it is easy to drop the drill, chisel or whatever tool is being used, or to shoot it from the hammer with the possibility of doing damage.



This danger has been eliminated in a new type of tool retainer developed by the Wodack Electric Tool Corp., 4627 W. Huron St., Chicago, Ill., and now incorporated as standard equipment on all Wodack

electric hammers.

The retainer is made entirely of moulded rubber and fits over the nose of the hammer with just the right amount of play for rapid drilling or cutting. Also, it keeps grit out of the socket in overhead drilling. Although simple in construction, the device is said to represent years of experiment in developing a retainer correct in every detail. Further information may be obtained by writing to the manufacturers.

PULLMORE CLUTCHES Used in Libby Turret Lathes



In the rapid traverse mechanisms of Libby International Turret Lathes there are two double-type Pullmore Clutches running in oil. These lathes are big, powerful, rugged, designed for heavy-duty operation day after day. Their



Pullmore Clutches "bear this punishment, stand the gaff" and are easily and quickly adjusted when this eventually becomes necessary. The ruggedness, reliability and efficient operation which make Pullmore Clutches satisfactory for Libby Lathes also make them ideal for use in other kinds of machinery and equipment. If your products require compact, efficient, economical clutches, investigate Pullmore Clutches.

Pullmore Clutches are made in single and double types, for operation in oil or dry, in capacities from 1 h.p. to 75 h.p. at 500 r.p.m.

> Use Quickmail Coupon No. 53 to get this BOOKLET

ROCKFORD DRILLING MACHINE DIVISION
Borg - Warner Corporation, 41,0 Catherine Street, Rockford, Illinois
Sold by MORSE CHAIN CO., Ithaca, N. Y. With offices in principal cities

Individual Motor Drives by Berkeley

Improved individual motor drives, ¼ to 20 h.p., engineered to meet the requirements of the machines, are announced by the Berkeley Engineering Co., 1381 East 17th St., Cleveland, O.

Although each drive is "tailor-made" for the machine to which it is applied, it is said that the use

of standardized parts keeps the cost at a low level and that the numerous advantages make the installations a profitable investment.

Chief of these benefits is the increased Individual flexibility. drives permit the machines to be located irrespective of line shafting in best positions for sequence of operations and where lighting is best. The Berkeley Co., also claim that the range of work is increasedwider speed ranges are available - shifting of



speeds for various types of work are simplified—and the efficiency of most machines is improved on an

average of 25%.

Berkeley drives have been developed as a result of long experience in the application of power to machine tools. Originally castings were used but to avoid the multiplicity of patterns Berkeley adopted welded construction which easily permits variations in standard mounting designs and facilitates the handling of

special installations.

Since most of the drives were formerly from overhead pulleys, it is necessary to provide an overhead support for the motor and its pulleys in applying individual drive. Where the motor is mounted high upon a single support, a welded box section is employed. Double column supports utilizing "T" or "I" sections are employed where large or complicated belt drives are necessary.

Geneva

Precision Dial Indicator

Universal Holder

Orders and repeat orders received are proving the merit of the Geneva lever movement. A sturdy lever arm does away with the usual complicated gear train.

No. 125-F with adjustable dial 0-50-0 indicating .001".

You will save time, trouble and money through the use of Geneva Dial Indicators. Simple in design—rugged in construction—accurate and dependable in service—these are the outstanding characteristics.

The Indicator is furnished with a plain back or with the Geneva Universal Holder which speeds up readings with an amazing range of settings—anything up to 180°

on the inner section of the ball joint—and 360° in any position on the 180° arc. A single knurled nut locks the ball joint.



Make certain that you have our illustrated bulletin giving complete details on this modern instrument which meets modern needs.

Complete information to organizations and dealers upon request.

Chicago Dial Indicator Company
180 N. Wacker Drive, Chicago, III.

Dial Indicators • Lens Measures • Depth Gauges

Berkeley offers a comprehensive engineering service in connection with the application of individual drives and full information may be obtained by writing direct to the Company.

New Hammond V-Belt Disc Grinders

The Hammond Machinery Builders, Inc., Kalamazoo, Mich., announce the addition of two disc grinders to their line of grinding equipment.



The new models, designated as CD-18 and CD-20, are for 18 or 20 inch discs. The spindle is 29 inches long overall and is mounted on four Timken roller bearings. The base is 24×24 inches at the floor line and the rocker shaft is $2\frac{1}{2} \times 58$ inches long. Either a 5 or a $7\frac{1}{2}$ h.p. motor drives the spindle by means of a multi-V-belt. The universal lever feed tables measure 6×11 inches, or plain tables $7\frac{1}{2} \times 18$ inches may be had. Further information may be obtained by writing the makers.

Pre-Finished Sheet Metals in Color

A cleverly prepared folder showing actual samples in their bright, attractive colors will acquaint you with Tint-Metal—pre-finished metals in color—offered by the American Nickeloid Co., Peru, Ill. A copy of the folder will be sent you on request if you mention The BLUE BOOK.

56

OUR BEST-PAYING INVESTMENT

- Does Better Work
- Boosts Production
- Cuts Labor Costs up to 75%.

STERLING SPEED-BLOC SANDER





Weight 5½ Pounds

The Sterling by its oscillating action is filling a decided need in industry, substantially cutting labor costs, increasing production schedules and enabling workmen to turn out a better finished product, without ridges, ripples or chasing. Replaces hand sanding and rubbing on wood, metal, fabric, leather, castings, stampings and composition surfaces. Designed for WET and dry work on CURVED and flat surfaces.

Investigate this modern, proved device Send Quickmail Coupon No. 38 for Circulars

STERLING PRODUCTS COMPANY

303H DONOVAN BUILDING.

DETROIT. MICHIGAN

Hunt Offers New Hydraulic Valve

C. B. Hunt & Son's Co., Salem, Ohio, offer a new valve embodying the same no-metal-to-metal-wear principle and minimum of moving parts characteristic of the "Quick-As-Wink" air control valves.

The illustration shows the bronze forged housing valve, hand lever operated for 4-way operation, made in 15, 34 and 1 inch sizes. Two and 3-way valves are also available. Two styles are provided for 1,000 and

2,000 pounds working pressure. bronze forgings used as housings are said to be the largest ever The use of made. these drop forged bronze housings with their high physical strength is said to provide an additional factor for long life with water or corrosive fluids.



The valving operation is accomplished in the 2-way valves with only one moving part; in the 3 and 4-way valves by coincident motion of two valve bodies or plungers. These are free-floating in special packings without metal-to-metal contact. Balanced port action in conjunction with the valving ring and the no metal-to-metal contact are claimed to assure long life and satisfactory performance in hard service. It is said that inspection, replacement of parts and re-assembly can be made within a few minutes without disturbing the hydraulic piping.

A complete new catalog is now available in which a special effort has been made to include all possible engineering data bearing on the subject. The makers will be glad to send you any special information de-

sired, and a copy of the catalog.

"What Makes Main Street"

Designated as a "bookful of Lathe Lowdowns" is the new Golden Anniversary catalog just published by The R. K. LeBlond Machine Tool Co., of Cincinnati, under the title "What Makes Main Street."



SHORT SHORT STORIES ABOUT The Magna-Sine



PAYS FOR ITSELF -- FIVE TIMES OVER!

Is the Magna-Sine worth its price? Here's an answer from a tool manufacturer—an actual statement that is typical of both written and verbal comments from Magna-Sine users.

"In our particular case", he writes, "we feel sure that in a year's time the Magna-Sine will have reduced our grinding operation costs by at least 10% and paid for itself five times over. While our business is of a specialized nature, we can see where the Magna-Sine could also effect remarkable savings in production grinding work."

Regardless of the volume of work requiring angular set-ups, you will find the Magna-Sine an investment that will pay immediate dividends. Be fully acquainted with its possibilities for grinding, honing, lapping, checking and other operations. Quickmail Coupon No. 63 will bring you complete information.

The MAGNA-SINE ROBBINS ENGINEERING CO.

639 Mt. Elliott Avenue,

Detroit, Michigan

Commemorating LeBlond's 50 years of service to the industry, the new book is said to give an unusual treatment to the subject of lathes. While basically factual in nature, it affords a new and original perspective of the Main Street of production where LeBlond lathes have played a conspicuous part.

The forepart of "What Makes Main Street" is embellished with four color pastels by a noted artist, providing a lathe's eye view of the Main Street of today's

production and civilization.

The remainder of the book is given over to a simplified and factual presentation of the complete Le-Blond line, written in concise and understandable language in an endeavor to give a panoramic picture of LeBlond lathes as the prime machine in industrial service.

Stick Quickmail Coupon No. 23 on an envelope and enclose 25 cents with your name and address when

you send for your copy.

New Lightweight, High-Conductivity Electrode Holder

Arc welders should be interested in the new electrode holder presented by the Jackson Electrode Holder Co., 6553 Woodward Ave., Detroit, Mich.



It is said that the model B-4, combining light weight with maximum conductivity, weighs 15 ounces, has a current capacity of 200 amps., handles rods 1/16 to 3/16 inches and is made entirely of Mallory 3 Metal, which affords strength with 85% of the conductivity of pure copper. The handle insulation is thoroughly ventilated. Upper tong and compression spring are amply protected by fiber insulation.

The makers will gladly send you full information if

you write to them on your business letterhead.

NOW .

The METALMASTER has selected VIMCO General Machine Lights as Factory Equipment!



¥ Increases Efficiency.

¥ Ends Glare. ¥ Universal Adj. Mount. ¥ Attractively Finished.

¥ 24 Types.

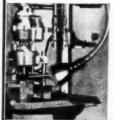
VIMCO was selected for Continental's Doall Contour Sawing unit because it best met the exacting requirements of high intensity concentrated illumination for this specialized machine.

Ettco chose VIMCO equipment for the Ettco Tapping Machine because in this particular case, VIMCO Lights

adequately solved a

very difficult job of illumination.





VIMCO Lights are especially designed for—not merely adapted to lathes, drill presses, etc., by specialists in general machine lighting. There's a type for every need—let our experts solve your lighting problems.

Quickmail Coupon No. 79 will bring you full information.

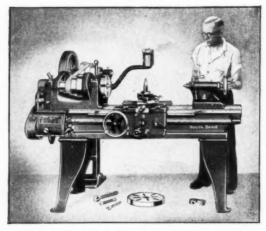
Vimco Products are manufactured and fully guaranteed by

VIMCO MFG., COMPANY, INC.

South Bend Pedestal Adjustable Motor Drive Lathes

A new design of back-geared, screw-cutting, precision lathes with pedestal adjustable motor drive is announced by South Bend. The new drive is available in the five sizes of precision lathes—9, 11, 13, 15 and 16-inch swing and in bed lengths from 3 to 12 feet.

The new motor drive mechanism is a separate unit with motor and countershaft mounted on a pedestal back of the lathe in a position horizontal with the headstock cone pulley of the lathe. V-belts transmit power from motor to countershaft and a flat leather belt from countershaft to lathe spindle.



Reversing switch is conveniently located near lathe spindle so the operator may start, stop or reverse the lathe from an easy working position. An adjustable tension brace between countershaft and lathe equalizes belt pull.

A turnbuckle adjustment provides adjustment for the cone pulley belt, and a release lever tilts the motor



MODERN Industrial machining operations requiring speed, precision and versatility are being handled in hundreds of plants, tool rooms, and machine shops by the new 9-inch South Bend Series "T" Lathes. New features that insure accuracy and maintain it over a period of years, combined with fine workmanship and design, prove these lathes to be a profitable and productive investment.

68 Sizes and Types of Lathes for every purpose.

9" lathe prices start at \$287 11" lathe prices start at \$371 13" lathe prices start at \$448 13" lathe prices start at \$448 16" lathe prices start at \$642



Send Quickmail Coupon No. 78 for BULLETIN

SOUTH BEND LATHE WORKS

193 East Madison Street, South Bond, Indiana, U.S.A.

END Precision LATHES

MODERN INDUSTRY

drive and facilitates shifting from one step of the pulley to another. The V-belts are enclosed in a substantial guard.

The new line of lathes offers a number of new features; heat-treated headstock spindle with all bearing surfaces hardened and ground, including the taper hole; spindles of special alloy steel with phosphor bronze bearings, line bored and lapped to a perfect bearing and adjustable for wear; new double wall apron with self-oiling steel gears; all gear shafts supported on both ends; multiple disc clutch in friction apron, etc.

A number of practical attachments are available for milling, key-way cutting, grinding, turning tapers, draw-in collet, chuck work, gear cutting, etc. These may be purchased with the lathe or ordered later.

These lathes are built in quick change gear and standard change gear types. The former are equipped with a quick change mechanism for cutting 48 right and left hand standard screw threads ranging from 2 to 112 per inch, including 11½ pipe thread. The standard types are equipped with a set of loose change gears for cutting right and left hand screw threads from 2 to 40 per inch including 11½ pipe thread.

Bulletins describing each of the five sizes of lathes with accompanying illustrations giving valuable instruction on lathe practice and operation may be obtained free by writing the Technical Service Dept., South Bend Lathe Works, 193 E. Madison Street,

South Bend, Ind.

Cincinnati Firm Throws Off Receivership

Emerging from receivership Aug. 31, announcement is being made that the Bradford Machine Tool Co., 657 Evans St., Cincinnati, are now doing business as formerly under their own firm name. They will continue to manufacture and sell a line of lathes and high speed production and tapping machines.

The Lincoln Electric Co., Cleveland, O., announce appointment of W. W. McClellan to the sales engineering staff of its Grand Rapids Office. 314 Building and Loan Bldg., Grand Rapids, Mich. Mr. McClellan has had wide, practical experience which should enable him to help welding users in the territory. He will be working under the direction of Mr. R. D. Layman, who is in charge of the office.

POWERFUL MACHINES



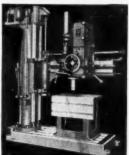
STEPTOE SHAPERS

Force feed continuous lubrication, heavy construction and Timken bearings throughout insure rigidity, accuracy and long life. Centralized controls are within easy reach of the operator at all times.

Instantaneous feed and speed changes may be made with fingertip control while the machine is running.

Send today for catalog No. 130.

WESTERN 12-SPEED RADIAL DRILL



Twelve geared spindle speeds of 40 to 2000 r. p. m. adapt this solidly - built, easily - controlled drill to small drilling and tapping jobs as well as to heavyduty milling and spot-facing operations.

Simple, centralized controls within easy reach of the operator, ball bearings throughout, instantaneous speed and feed changes and easy swinging head make accuracy a commonplace.

Twin disc clutches, 6 geared feeds and elevating mechanism fully enclosed and running in oil contribute to easy, dependable operation.

Write today for your copy of the 12-page circular illustrating features of the Western drill that will save money in your plant.

Western Machine Tool Works

Barber-Colman Automatic Hobbing Machine

High speed, continuous hobbing of spur gears and pinions for small precision instruments such as meters, clocks, watches, cameras, motion picture apparatus and the like, covers the field for which the Type S Barber-

Colman hobbing unit is intended. It handles work up to one inch diameter by ½ inch face of any machinable

material.

Fully automatic, the cycle includes work-loading, rapid approach to hob, feed, quick return, ejection of work and repeat. Easily set up, the machine is merely kept loaded, although it may also be hand loaded and operated as a single cycle machine.



The unit illustrated is for bench installation, but may be supplied with a pedestal for single installation, or a base for battery

of units.

The spring-loaded tail spindle, in precise alignment with the work spindle, automatically withdraws at the end of each cycle to release the work, then advances, moving a new work piece from the magazine into driving spindle.

The cam-operated magazine automatically presents work-piece to spindles and holds enough blanks to let

operator service other machines.

The hob spindle can be adjusted quickly and accurately to lead angle of hob by means of clean-cut graduations and vernier. A quick-acting clamp locks the hob spindle solidly.

Coolant circulated by direct-driven gear pump floods hob and work. Machines arranged in batteries can be

supplied with coolant from a central reservoir.

Send Quickmail Coupon No. 48 to the Barber-Colman Co., Rockford, Ill., for an attractive leaflet illustrating and describing the many appealing features of the new type "S" unit.

56

MARSCHKE

Formerly Van Dorn, Black & Decker

HEAVY DUTY GRINDERS AND BUFFERS

You know what a man means when he describes a job as "A DIRTY DAILY GRIND," but have you stopped to think that the term probably developed from observing ordinary services of Floor Stands, Swing Frame Grinders, Buffers and similar machinery.

You need a good machine for that kind of work. It must have "heft" but it must also have refinements of design for convenience and safety of operation and exacting execution of that design to exclude the dirt from motors and bearings.

That is one of the reasons for standardizing on MARSCHKE GRINDERS and BUFFERS—formerly made by Van Dorn, Black & Decker—now being manufactured and sold by

VONNEGUT MOULDER CORP. 1805 Madison Avenue Indianapolis, Ind.



Procunier Universal Tapping Machine

As suggested by the name, the new Procunier Universal handles a wide range of materials and sizes, with five operating speeds ranging from 385 to 2240 r.p.m. Two interchangeable Procunier tapping heads provide a capacity range from No. 8 tap to 5%" inclu-

sive. A unique arrangement of long helical springs, adjustable over a wide range, is said to maintain pre-set tapping and reversing pressures independent of the operator, facilitating precision tapping at high speeds with maximum protection for taps and work.

Automatic continuous lubrication of the tap (only while tapping) is provided. Through convenient timing and volume adjustment lubrication can be set to give the correct amount, starting precisely as desired. Additional chuck spindles are available for external threading.

Procunier sensitive high speed tapping heads, the Procunier Tru-Grip tap holder, precision hand screw height adjustment of the working

table, precision depth stop adjustment, and the offset foot pedal which permits the operator to sit directly facing the work table without endangering the knees are a few of the additional attractive features of this new tapping machine.

The Procunier Safety Chuck Co., 14-A S. Clinton St., Chicago, Ill., will gladly send full details on request.



The Eastern Cutter Salvage Corporation, 30 Littleton Ave., Newark, N. J., have issued a new 40-page catalog illustrating and describing tool salvaging and hard chrome plating. Write for a copy on your business letterhead mentioning The BLUE BOOK.





Complete catalog of collets and fingers

SUTTON DIAMOND-GRIP COLLETS

Grip tighter under less tension and reduce spoilage. Single-piece, master, and compensating master styles.

SUTTON FEED FINGERS

Are perfect companions for DIAMOND-GRIP Collets. Single-piece, master, and compensating master styles.

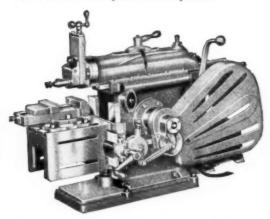
Your request today will bring the complete Sutton Catalog by return mail. Use Quickmail Coupon No. 59.

SUTTON TOOL CO., 2836 W. Grand Boulevard, DETROIT, MICHIGAN

Only Sutton Collets are Diamond-Serrated

Atlas Announces New Bench Shaper

Offered as an advance in efficiency, economy and versatility on small work, the new Atlas 7-inch shaper is the latest addition to Atlas machine tools, which now include back-geared lathes, sensitive drill presses and mechanical and hydraulic arbor presses.



The ram-driving mechanism is of the bull gear type; stroke (quick return) is from ½ to 7¾ inches. Complete V-belt drive from motor to bull gear spindle provides four speeds between 45 and 200 strokes per minute. Automatic cross feed provides five feeds in either direction between .005 and .025 inches per stroke. A ½ hp., 1740 r.p.m. motor is contemplated, and a floor stand is available. Bearing surfaces are large and accurately finished, and provision is made for adequate lubrication.

Condensed specifications:—cutting speeds 3½ to 116 feet per minute; table travel 8½ inches horizontal, 4½ inches vertical; maximum distance, table to ram 5½ inches; minimum, 5½ inches.

Complete description and specifications may be obtained from Atlas Press Co., Dept. 4, Kalamazoo,

Mich.

Send for the new S. S. WHITE Catalog

36 pages of equipment that will help you cut your shop costs

FLEXARMS

Flexible shaft arms with hand piece on one end and motor coupling on the other. Easily attached to any motor of suitable rating, making an inexpensive shop tool for die-sinking, drilling, grinding, buffing and many other uses.



INDUSTRIAL HANDPIECES

Super-Quality
BURS, DRILLS, ABRASIVE POINTS,
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The S. S. WHITE Dental Mfg. Co. INDUSTRIAL DIVISION

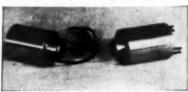
10 East 40th St., Room 2310-H, New York, N. Y.

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NAME	
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CITY	STATE

Kingsbury Solenoids

Developed originally for tripping the Kingsbury drilling head, the solenoids shown here have been made available for manufacturers of other machinery.

Two types are available, Model 32-269 and Model 150-1. The former is distinguished by lead wires in place of terminals. In both, the coils are rigidly enclosed within steel cases and thoroughly protected with oil and moisture resisting impregnation.



The slotted solid plunger and pole piece construction is said to permit economical redistribution of iron in the magnetic circuit to effect variations in the character of the pull curve to meet individual requirements. Because of the magnetic balance and high grade bearing between plunger and coil bushing, it is asserted that operation is possible in any position with equal efficiency. The construction admits use of a magnetically shielded return spring, further facilitating mounting in any position. Pole piece and plunger are made from low carbon steel bar multiple slotted to reduce eddy currents, and chromium plated to minimize the effect of residual magnetism.

The Kingsbury Machine Tool Co. designed and manufactured details for this solenoid which vary the average pull, the possible duty cycle, the effective stroke, the type of pull curve or the method of connecting the load. Write them at Keene, N. H., for any

desired information.

The Progressive Hydraulic Self-Stripping Punching Unit is thoroughly explained in an attractive bulletin recently issued by the Progressive Welder Co.. 737-A Piquette, Detroit, Mich., copies of which will be sent you on request.

ACE SPOT WELDERS

FOR ECONOMICALLY FASTENING OR JOINING ASSEMBLIES OF SHEET METAL OR WIRE. CHEAPER, FASTER AND BETTER THAN RIVETING.



Available in sizes from 5 K. W. up.

Priced as low as \$90.00

Investigate possibilities of increasing your profits by using ACE Spot Welders. Send Coupon No. 15 today for full details and prices.

PIER EQUIPMENT MFG. CO.

627 Cross Street, Benton Harbor, Michigan

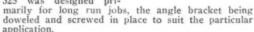
Knuckle Action Vises

The Knu-Vise Products Co., 6436 Cass Ave., Detroit, Mich., offer knuckle action vises of a new type for use in drilling, reaming, tapping, countersinking, milling, assembly and other operations. Bushing plates and angle brackets can be supplied for making drill jigs, tapping fixtures, etc.

The vises are designed for rapid insertion and withdrawal of work pieces, and quick application of

pressure with minimum effort. Movement of the clamping handle is through 30 degrees only, while maximum movement of the clamping jaws is about 34 inch, said to be sufficient for most jobs. The work is always in plain view of the operator and ample chip room is provided.

At present three models are available-Nos. 325. 330 and 333, the latter being illustrated. Model 325 was designed pri-



Model 330 is of interest as there is but one movable jaw which clamps the part firmly against a keywaved heel-plate that may be moved up and down or swung to any angle. The versatility and rigidity of this model are said to make it ideal for use on milling machines employed for finishing small parts or machine screw products.

The model shown (333) is of all-around value. The angle bracket moves up and down, may be swung to any angle or used merely as a chute to direct away the finished product. Both jaws move uniformly and thus keep the work always in the same relative position, even allowing for stock variation of the work.

One set of jaw inserts is furnished as a blank, and finished by the customer to suit individual requirements. Further information and a descriptive folder

will be sent on request.



HI-DUTY

PNEUMATIC MARKING MACHINE

This is a light, general purpose hand marking machine for use on flats, rounds and irregular surfaces, which is supplemented with an air cylinder to take the place of the foot pedal for applying pressure to



raise the work table to the lettering tool. Air from the shop line is used and the four way foot valve assures fast operation. Machine uses solid flat or round dies, as well as adjustable type, in flat or knurl type holder.

Advanced business methods demand improved records of metal fabrications and this machine makes marking operations quick and simple. Part numbers — order numbers — manufacturer's name and other important data marked on your products will mean permanent records, to last the life of the part. This general purpose marking machine will help you.

MODEL 25

Send Coupon No. 70 for complete catalog of our full line of Marking Tools, Machinery and Equipment.

Designed and Built By

GEO. T. SCHMIDT, INC.

1802 Belle Plaine Avenue, Chicago, Illinois
Builders of Marking Equipment since 1895,

Pyro "Bi-Optical" Pyrometer

The Pyrometer Instrument Co., 103 Lafayette St., New York, offer a new combined color pyrometer, based on the use of light filters and color wedges which are transparent to a number of colors simultaneously.



By using filters with a number of transparencies both for separation and for mixing and toning down, it is explained that any complicated optical or mechanical device for the production or combination of colors is rendered superfluous, and the creation of a surprisingly simple temperature measuring device in the form of colored discs is rendered possible. It is asserted that the new Pyro Bi-Optical Pyrometer is the only instrument for technical and scientific measurements by which the temperature of the "black body" and the "actual" temperature may be ascertained simultaneously.

The instrument is furnished with scale ranges from about 900-1900° C or 1700-3500° F. The new instrument may be used for many laboratory and research applications, including incandescent iron and iron alloys in the open and flame heated furnaces. It will be exhibited for the first time at the National Metal Exhibition, Atlantic City, and meanwhile, the makers

will gladly send you full particulars.

The Hammond Machinery Builders of Kalamazoo, Mich., announce appointment of Mr. C. D. Hollins. 2132 Morse Ave., Chicago (phone Briargate 6365), and Mr. C. P. Guion, 1661 Milwaukee Ave., Chicago (phone Armitage 0343), as their representatives in Wisconsin, Illinois, Iowa and Indiana in the sale of Grinders for foundry use. These gentlemen will handle the account jointly. Both are well known to the Foundry Trade and are qualified to help solve grinding problems.

76

For All Purposes



You'll find in the Progressive line, types, forms and sizes of End Mills for practically every purpose—and our designers are always at your service, ready to co-operate in the production of special End Mills to meet your specific needs. Just send your blueprints to us when you encounter a difficult problem in End Milling.

Progressive Shear Cut End Mills are scientifically designed and accurately made from the finest materials, which is your assurance of satisfactory service and economical precision performance.

The Progressive catalog showing our complete line of end mills will be sent you free on request.

PROGRESSIVE TOOL & CUTTER CO. FERNDALE, MICHIGAN

How Dumore Did It

From a collection of case histories illustrating the adaptability of Dumore grinders, the Dumore Co.,

Racine, Wisconsin, offers this anecdote.

The problem was to grind the radii of a field stamping die. Formerly the job was handled by chucking in a lathe. A grinder was also set up and the die was rotated back and forth by pulling the belt. It was a cumbersome method, and hard to set up.

In the improved method of handling the job, a Dumore grinder was mounted vertically on the head of a milling machine and the die was clamped on the table. The manner of holding the work facilitated its



movement, and the operator was able to view the job without difficulty.

U. S. Tungsten Mines Supply Carboloy Needs

Users of cemented carbides will be interested in a recent announcement by W. G. Robbins, President of Carboloy Co., Inc., Detroit, concerning the world situation affecting tungsten. While tungsten concentrates from China have been used for the manufacture of tungsten carbide for Carboloy for several years, the General Electric Co. has purchased two tungsten mines in the United States and the material from both of these mines is of the high purity demanded for Carboloy requirements. Although shipments of Chinese concentrates have been suspended, the General Electric Co., assures the Carboloy Co., its subsidiary, that an adequate supply of tungsten will be available from domestic mines to satisfy all Carboloy needs, and no increase in price is anticipated.

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ENGINEERING SERVICE

More and more, industry has learned that it pays to take advantage of the engineering service offered by this company. Consultation in the period of assembly design many times results in minor changes permitting lower costs thru standardization, improved service and often economies thru multiple rivet setting. Where this preliminary consultation is not permissible send blue print or preferably sample assembly for production study and analysis involving the use of tubular or split rivets.

CHICAGO RIVET & MACHINE CO.

Complete line of automatic riveters for setting up to 4 rivets at a time.



ONE OF THE WORLD'S LARGEST MANUFACTURERS

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It will bring you our rivet price list and illustrations of Chicago Aut.matic Rivet Setters. On specific production problems write letter and send sample assembly or blue print.



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You'll Never Know—the efficiency of Mall Grinders until you investigate!

MALL flexible shaft grinders in your plant will greatly reduce finishing costs by enabling your workmen to produce more work quickly and efficiently.

There is a type and size of MALL grinder for your metal finishing job — whether it is grinding, sanding, polishing or buffing.

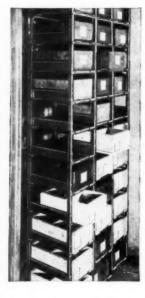
Send Quickmail Coupon No. 46 for a copy of our catalog and let us assist you in selecting the unit best suited for your work.

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STACKED— and Still Accessible



Send for the facts on STACKRACKS Write for descriptive literature—see how little it costs to add room to your shop, time to your day.



STACKRACKS add extra floor space to your shop. These heavy steel individual racks, made to fit your shop boxes, trays or tote pans, securely lock together without the use of tools to form a rigid unit of any capacity and height. Stack scattered boxes up, out of the way, squarely and safely.



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For Foundries, Welding Shops, Railroad Work, Concrete and Stone Grinding, Etc.



No. 4 WYCO machines have plenty of power and speed for heavy duty grinding. Slow speed motor can be furnished for stone grinding.

Model No. 43-1 H. P. machine with 3-speed belt drive, similar to Model No. 31, complete with bakelite bond grinding wheel and wheel guard. Speeds up to 6000 R. P. M. \$165.00.

WYCO "Roll-Easy" Truck

Any WYCO Grinder from ½ H. P. to 1½ H. P. can be supplied with "Roll-Easy" truck base at only \$10.00 extra.



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WYZENBEEK & STAFF, INC.

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Phillips Recessed Head Screws

Send Quickmail Coupon No. 76 for catalog No. 9—a reference manual of screw driver bits—and catalog No. 8 covering Apex Production Tools for Drilling, Tapping, Reaming, Boring, Stud and Nut Setting and Universal Joints.



for PHILLIPS

Recessed Head Screws (Pat. No. 2046840)

and all kinds of SLOTTED HEAD SCREWS

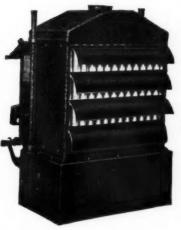
APEX-PHILLIPS Hand Screw Drivers and APEX-PHILLIPS Bits for Electric and Air Tools—for all types and sizes of Phillips Recessed Head Screws—are quality tools that will stand the hardest kind of service. Made of a special shock resisting steel combining the qualities of extreme toughness, wear resistance and hardness. Prompt shipment.

Apex Screw Driver Bits for Phillips Recessed Head or Slotted Head Screws will reduce your screw driving costs. Many of the largest users of screws have proved this.

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4 Sizes
31/2 to 81/2 inch Jaws

Arbor Presses 12 Sizes From ¾ to 10 ton Pressure



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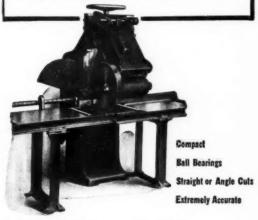
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2 Sizes 12 and 14 inch Jaws

SHELDON MACHINE CO. 3257 Cottage Grove Ave., Chicago, III.

"OLIVER" CUT-OFF SAW

cuts mouldings, tubes, strips of metal, compositions . . . accurate to .005"



Saves you time, space, money!

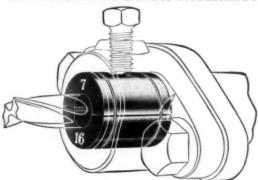
Metal workers find it highly efficient on production work. Makes straight or angle cuts with saw or cut-off wheel. It is self-contained and unusually compact. Runs very lightly without rebound. And it will cut hundreds of pieces without variation of .oo5 inch. Has high speed precision ball bearings for smooth operation, long life and low upkeep.

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OLIVER MACHINERY COMPANY GRAND RAPIDS, MICHIGAN

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For DRILLHOLDERS for use on Automatic Screw Machines



BANNER BUSHINGS

are hardened two-piece bushings designed for use in drill holders for B & S automatic screw machines. This type of bushing clamps the full length, requiring very little pressure from the clamp screw to hold the drill firmly. When the clamp screw is loosened, the pressure is released.

All bushings smaller than 3/32' have a milled hole. This feature assures accuracy in the small sizes. The larger sizes have drilled holes.

BUSHINGS ARE CARRIED IN STOCK FOR IMMEDIATE SHIPMENT.

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8 in. diameter round or 8 in. by 16 in. flat. No. 5 SIZE

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WELLS MFG. CORP. Three Rivers. Michigan

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Prompt delivery from stock on over 10,900 standarditems — over 6700 ACME Standard — over 4200 A. S. A. Standard — all completely finished ready for use. Special sizes made to order.



Made in our new plant by the most exacting and scientific methods — insuring accurate fit plus long wear—concentric within .0003* full indicator reading.

Types shown at left, top to bottom, are: plain stationary press fit, type 'P'; shouldered stationary press fit, type 'S'; removable slip, type 'R'.



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are built by Motor Specialists

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PORMERLY manufactured by Rocaford Machine Tool Co., of these dri is have been installed in plants the country over, where they have been giving universal assuraction.

Counterbalanced, eightapeed spindle,
made from high
carbon special
steel, has quick
advance and return; positive
feeds are instantly available
while machine
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all controls with
all controls with
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POWERFUL-SIMPLE-DURABLE-ACCURATE

We have been builders of Drilling Equipment for more than 20 years and, in addition to the above drills, manufacture the Cleereman Automatically Oiled, Anti-Friction, High Speed Drilling, Boring and Tapping Machines; Gang Drills and Special Drilling Machinery.

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NEW STERLING RACKS



Sterling Racks provide a place where parts are quickly found, and make parts easily accessible.

A Sterling Rack and Box Unit makes an ideal "file" for special tools, or machine parts or accessories used for certain jobs.

Sterling Racks will relieve crowded working conditions, due to piled up shop boxes in alley-ways and around machines. They put these up out of the way, tidy up your shop and by making it easier to get around save workmen's time.

Racks so designed that complete self contained units of any size can be welded together at our plant to conform to your space requirements.

Unit shown for 40 boxes 10½" wide 6" high and 21" long, is 60" high, 64" long and 21¼" wide. Boxes have cardholders.

Sterling Factory Equipment Co., Providence, R. I.

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:	PROVIDENCE, R. I.

Kindly quote on tack shown.

Kindly quote on following size rack.

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AGAIN

steps ahead with a New Idea!

Heretofore there has never been a positive way of locking a Set Screw: vet if it works loose there's no telling what may happen.

We licked the problem by simply knurling the two top threads of the "UNBRAKO", as shown.

This knurling raises sharp prongs all around the edge of the thread which dig right into the threads of the tapped hole when the "UNBRAKO" is being tightened up, so it can't possibly work loose.

Over 2,000,000 already have been bought, used and proved satisfactory.

Send for Free Samples.

This time it's

SELF LOCKING HOLLOW SET SCREW



Fig. 1564 Pat. Applied For

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- 3. They are highly adaptable, and engineered for long life.
- 4. They will continue to save you money throughout their entire life.

Because Delta drills are built to precision standards in a modern production plant, they cost you less than any comparable drills you can buy.

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Because they are thoroughly engineered and tested under production, they will "stand up and take it" alongside drills costing several times more.

Because of their low cost, low maintenance and low power consumption, they can be used in dozens of places in your plant where heavy, expensive machines would be out of the question.

Let us tell you the complete story of Delta Drill Presses, 11^s, 14^s and 17^s models. Send Quickmail Coupon No. 29 —NOW — for complete information and name of nearest dealer. It will pay you dividends.

DELTA MFG. COMPANY

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For the First Time! Vacuum Cleaning Made Applicable to All Plant Cleaning Requirements at Low Cost With



Breuer's Ball Bearing
TORNADO

Portable Industrial Vacuum Cleaner

This new machine is designed to solve all industrial cleaning problems without the expense of installing a stationary plant or using so-called portable cleaners which are too heavy and expensive for average plant applications.

TREMENDOUS POWER

1 H. P. Motor-461/4 Waterlift

Do not confuse the TORNADO with light-duty cleaning machines. Model 112 combines light weight (only 40 pounds) with tremendous cleaning power (1 H. P. C. E. ball bearing Motor—4614 waterlift). Patented principle of separating fine dust from refuse and depositing heavy dirt in tank makes this cleaner as applicable to heavy duty work as the largest machines. Sturdy construction insures long life and low yearly cost.

Has plenty of power and capacity to handle dust, dirt, sand, sandust, metal scraps, filings, etc. Attachments available for cleaning boilertubes, ovens, machinery, walls, floors, pipes, etc. Motor unit can be quickly removed for blowing dust from motors, etc. The handlest heavy duty, low cost, time and labor saving unit ever built.

We prove TORNADO advantages right in your plant without obligation. Send Quickmail Coupon No. 30 for details of trial offer and further information or write.

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atlas

MACHINISTS VISES

with RIMCOLOY CASTINGS



Secret of strength in Atlas Machinists Vises is the scientific design, extra weight, and the tough close-grained Rimcoloy castings used. Secret of grip is the changeable Maxel tool steel jaws, machined to a perfect fit and serrated for uniform grip. If you need vises buy Atlas. They're priced right and truly built to stand the gaff.

For complete information send Quickmail Coupon No. 34.

ATLAS PRESS CO.

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CHICAGO 35 E. Wacker at Wabash Factory Displays at: NEW YORK 130 W. 42nd St.

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Ettco-Emrick MULTIPLE

Here's a cut of our No. 71 Gravity Feed Foot Operated Machine with our Standardized Multiple Head.

It produces 2600 threehole pieces or 7800 holes per hour to a class 2 fit.

Another produces 1400 eight - hole parts or 11,000 holes per hour.

And a part with 18 holes at 1200 pieces or 21,000 holes per hour should give you ideas.

EVEN PARTS WITH ONLY ONE HOLE ARE TAPPED AT AN AVERAGE OF 2600 PER HOUR BY OUR DOUBLE FEEDING METHOD

Surely there has been a lot of progress in the economical and better tapping of small holes.

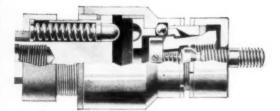
If you will send us a drawing we'll get you out a standard quotation—tell you the production and give you a good idea of how we will engineer the job.

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ETTCO TOOL CO.

594 Johnson Ave.,

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TITAN STUD SETTER

Sets Studs to a Uniform Degree of Tightness without Strained or Mutilated Threads

The Titan Stud Setter is a new controlled drive type for driving stud bolts, being full automatic in loading and releasing. It is a power-driven unit adaptable to all types of drill preses, air or electric tools, both portable and stationary. Operates at high or low speeds. Positive in driving and automatic in releasing. Studs may be

set to any predetermined degree of tightness.



The possibilities of increased production with this tool, due to its capacity, speed range and service, plus the added economy that its safety features assure by automatic operation—all contribute toward making it a tool worthy of investigation and profitable to use.

TITAN TOOL COMPANY



FAIRVIEW, PENNA., U. S. A.



Ranks Side-by-Side With Your Big Machines!

\$53.90

(with 1/3 H. P. A C 60 cycle, 110 volt motor.)

Compare it point-for-point: sixspline spindle, mounted on 4 precision ball bearings, with pilot wheel feed, calibrated depth stop, positive return spring action. Jacobs (0 to ½) Key Chuck 24% column 20% bit

spring action. Jacobs (0 to ½°) Key Chuck. 2¾° column, 30° high. High quality materials throughout, machined to close tolerances.

Send Quickmail Coupon No. 77 for descriptive bulletin.

Walker-Turner Co., Inc. 17107 Berckman St., Plainfield, N. J.

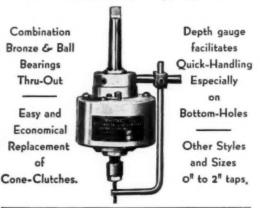
Engineered POWER TOOLS

ERRINGTON HYSPD

Super-Sensitive Ball Bearing

Cone Drive

2 to 1 Auto-Reverse Tapping Chuck



Size	Taps in Steel	Taps in Cast Iron	Price	Code
No. 00	0° to 3/16°	to 1/4"	\$35.00	Phlam
No. 0	to %°		\$50.00	Phalanz

The principle on which this Style is designed is especially effective on very small tapping; whereas in the

No. 0 size the Frictional Grip is Greatly INTENSIFIED, to cover a wider range, without loss of sensitiveness.

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Save 50% to 60%

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Their use permits less skilled mechanics — work assured on time — real savings — GREATER PRODUCTION PER DIE, DUE TO MORE ACCURATE CLEARANCE.

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(For materials up to 3" thick).



Cut illustrates S-1 for 1° materials.

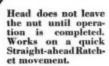
OLIVER INSTRUMENT COMPANY

1408 EAST MAUMEE ST.

ADRIAN, MICHIGAN

FOR QUICK TURNING OF NUTS

FAVORITE
Reversible Ratchet
WRENCH



Reverse motion instantaneous by simply turning pawl. New Metal in all parts enables the "Favorite" to withstand harder and rougher usage.

A TIME-SAVER

Skinned Knuckles Avoided and

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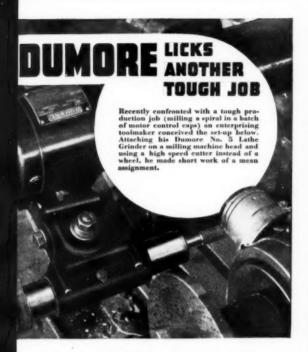
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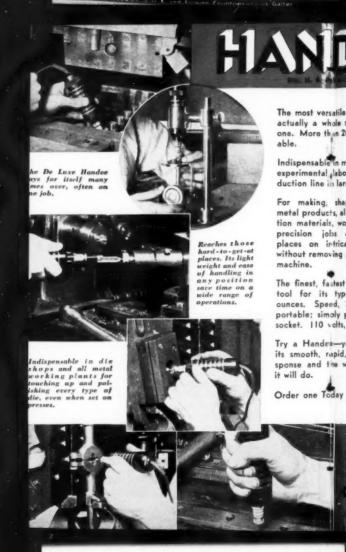
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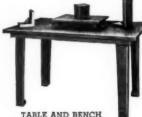


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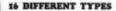
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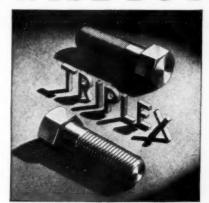
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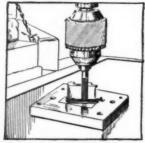
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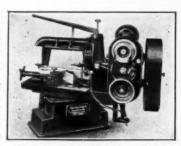
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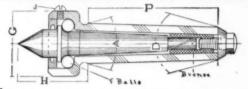
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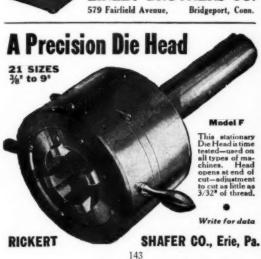
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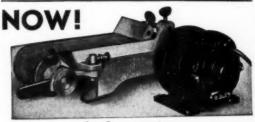
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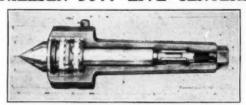
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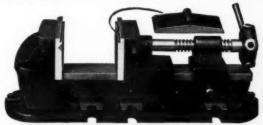
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Screw machine. Acme. plain head #v4" belt drive	125.
Community D & C No Indian head 8"49" haladaine	
Screw machine, B. & S., No. I plain head. #"x3", belt drive	225.
Screw machine, F & W., 1 x15 , cone grive, plain nead	200.
Screw machine, Foster, No. 5 geared nead, 14"x8", power feed, s.p.d.	500.
	250.
Screw machine, Garvin, No. 3, friction head, 14"x7", belt drive	150.
Shear, U-52, Pexto, power square, 16 gauge, belt drive	325.
Shear, 44", Chicago Steel, square, 14 gauge, 18" gap, with motor Shear, 10" Niagara circle, No. 20 gauge, cuts 88" dia. circle	400.
Shear, 10" Niagara circle, No. 20 gauge, cuts 58" dia circle	40.
Shear Niagara, No 05 circle, No 18 gauge cuts 48" circle	75.
Separator, McKinzie, for chips, blower type, belt or motor	250.
Separator, McKinzie, to Cinbal to deliver type, beit or motor	
Separator, 11 quart capacity, belt driven. Separator, American, capacity 1‡ bushela, belt driven. Shaper, 16" Queen City, plain gearedcrank with viseand countershaft	50.
Separator. American, capacity if bushels, beit driven	250.
Shaper, 16" Queen City, plain geared crank with vise and countershaft	325.
Shaper, 16" Steptoe, back geared, crank with vise and countershaft	400.
Shaper, 16" Cincinnati back geared crank, with vise & countershaft	425.
Shaper, 16" Cincinnati back geared crank, with vise & countershaft	450.
Shames 94" Outson City back geared crank S P D formator	750.
Tapper R. & S., I" capacity, horizontal, on pedestal.	75.
Tanner, Garvin, No. 2 automatic, canacity #" and #" helt drive	150.
Threader 1"H & G. Fastern Mach Screw Corn helt deline	125.
Turnet lathe 91"v94" I & I graved head tools for her mark	
Tapper R. & S. [" capacity, horizontal, on pedesial tapper R. & S. [" capacity horizontal, on pedesial Tapper, Garvin, No. 2 automatic, capacity # and f" belt drive. Threader, P. & G. Esstern Mach. Screw Corp., belt drive. Turret lathe, 24 "x34", J. & L. geared head, tools for bar work. Turret lathe, 34 "x34", J. & L. geared head, with cluck for chuck work.	250.
Turret lattie, of was , Join, geared head, with chuck for chuck work.	350.
172	

FOR SALE BY

Joseph Hyman & Sons, - Tioga & Almond Sts., Philadelphia, Pa.

POWER PRESS SPECIALISTS 407 A & 405 B Bliss toggles, tie rod. 150 ton E52 Ferracute embossing. 600 ton No. 25K Bliss embossing K 500 ton American Can embosing K.]

SPECIALISIS

No. 79# Bliss, 16" stroke tie rod.

10"x#" shear gap. 15" Wais & Roos.

Shuster straight & cut off #"x14". Hundredsof presses of various types.

FOR SALE BY

Brownell Machinery Co.,

Boring mill, King 40", vertical. Drill, radial, 22" Fosdick cone. Gear cutter, No. 14 Whiton S. & B Grinder, Walker rotary surface, 13" magnetic chuck.

150 Pine Street, Providence, R. I.

Miller, No. 33 Kempsmith, 50" Planer, 24"x24"x6' Whitcoml second belt drive. Whitcomb-B, Shaper, 20" G. & E., B. G. Threading lathe, automatic, 13x6.

FOR SALE BY

Reliance Machinery Sales Company

1405 Brighton Place, N. S.

Air compres., 90 and 342 cu. ft. Ing. Brake, press, 72" Rob. toggle m. d. Brake and folder. 72" Riagara, 22 gauge, motor 3-80-220. Bulldozer, No. 9 W.-W., 70,000 lbs. Drill. 4 spindle Colburn, Mfg. type, cap. 2", like new. cap. 2", like new. Drill, 25" Prentiss, tapping att.

Hammer, 80 lb. Brad. cushion helve. Lathe, 20"x12' 6" Am., cone, taper. Lathes, spinning, 30" Bliss & Tol., roller bearing. Miller, No. 4 Cin., plain, cone.

Pittsburgh, Pa. Nibbler, No. 1 Gray 34" tht., 3/16"

capacity, m. d. Press, Robinson dbl. cr., 80" wide, 4" shaft, grd. 3" stroke. 4 Shaft, grd. 3 stroke. Riveter, Townsend, cap. 5/16", 21"tht. Saw, hack, 12"x12" Racine, m. d. Shapers, 16", 20", 24", 25", crk. Shapers, 16", 20", 24", 25", crk. Shear, double angle, 6x6x3/4" Clev.,

mounted on turnable, m. d. Thread roller, No. 119 Bliss. Welders, 300 and 400 amp, Lincoln, motor end 3-60-220-v.

FOR SALE BY

Brown Machinery Co.,

Brake, Chicago Steel, 8' 18 gauge. Drilis, 14, 16, 20, 22, 24 & 42" Drill, rail, Foote-Burt, 4-spindle. Drills, 16 & 20 spindle Natco. Grinders, cylinder, Madison, No. 65 Heald.

Grinders, cylindrical, 12"x42" and 10"x30" Landis, 14x72" Norton. Grinders, disc. No. 6-20 Besly; No.

Grinders, disc. No. 6-29 Bealy; No. 229 Badger automatic.
Hammers vert. 40 lb. Perfect and Bradley, 120-lb. Kane & Roach.
Lathes, 28°812' Putnam, taper att.;
18°36' Rahn-Mayer; 18'36' L. & Lettles, tur.; 18'36' Rafford.
Littles, tur.; 18'36' Bradford.
Littles, tur.; 18'36' A. Kecimnith;
No. 2-B Milwaukee; 24 Fox;
2-B Own.

3-B Owen.

Millers, universal, No. 2 Hendey-Norton; Lincoln type, No. Hendey; slab, Briggs type No.11. 2333 N. 9th St., St. Louis, Mo

Planer, 42"x12"x18' Putnam, 3 hds. Planer, 26"x26"x6' Whitcomb. Presses, straightside, No. 7 Zeh & Hahnemann, S. S., SG81 Ferracute, grd., dbl.

Press, 300-ton hydraulic.
Presses, o. b. i. Nos. 1, 2, 3, 4
Loshbough-Jordan. Loshbough-Jordan.
Punches, agl. end. Cleveland "C"
26" thr. § in §". Rock River Style
L rapid action, 38" thr. §" in §".
Punch & shears, dble. end, No. L-10
Badger 10" thr. § in §".
Riveters, No. 5A High Speed §" cap.;
Grant §" B" throat, M. D.
Saw, cold, Highey No. 14.
Serew machines, No. 2‡ P. & W.;
Ix18" P. & W.
Shapers, 16" Barker; 20" Smith &
Mills; 20" Cincinnati.
Shear, rotary bevel, §" Lennox.

Shear, rotary bevel, &" Lennox. Shear, squaring, 10' Stark.

FOR SALE BY

Marr-Galbreath Machinery Co.,

Air comp., 9x8" & 10x8". Boring mill, 42" Bullard, I swivel and I turret head, m. d., p. r. t. Boring mill, 30" Colburn, turret hd, Boring mill, 30" Bullard VT L, threading attachment.

Brake, 7'x 18 ga. Robinson, hand. Brake lining punch and riveting machine, m. d. Bulldozers, Nos. 24 & 25 W-W, AC.

motors.

motors.

Crimping & corrugating machine, 10"x16 Ga., K.ceuc.
Die sinker, No. 3 P. & W., r. t.
Drill, 24" Aurora, t. a., m. d.
Drill, 29" Superior, b. g., power fd.
Drill, No. 11-B, Natco, 16-sp., m. d.
Drill, radial, 3" Canedy, Brolley, Brolly, Tadial, 3" Canedy, Otto.
Forging mch., 14" Acme: 24" Ajax.
Furnace, temp. & Ardening 24x [238"] Forging men., 11 Achie; 21 Ajaa. Furnace, temp. & hardening 24x12x8", Grinder, univ. T & C. No. 2 Woods, Grinder, univ. No.3 Cin.16"x48", m.d. Grinder, pl. 11 B. & S. 4x30" (cheap).

Grinder disc, No. 2 Gardner, 20" wheels, m. d. 3/60/220. Hammer, power, 50 lb. Boss, b. d. Hammer, power, 50 lb. Little Giant, Hammer, 100 lb. Mayer, power. Hammer, 2001b. Beaudry, power. Hammer,400lb. Bliss board drop,b.d. Hammer,800lb. Erie SF steam or air. Hammer, Syntron Elec., 1/60/110/. Hammer, Syntron Elec., 1/89/110/. Hoist, chain, 4-ton tripler, Y. & T. Keyseater, No. 2 Catlin, cap. 2'x15''. Keyseater, No. 3 Mitts & M., belt. Lathe, 11'x4' So. Bend, qcg., chuck. Lathe, 16'x12' L. & S., qc.g., ta. Lathe, 16'x12' L. & S., qc.g., ta. Lathe, 20'x10' Johnson q. c.g., ta., Lathe, 20'x10' Johnson q. c.g., ta.

chuck.

Lathe, 22"x12' Rahn-Larmon, q.c.g. Lathe, turret, No. 4 W. & S., bar feed, m. d., g. f. h. (2). Miller, univ. No. 2 Cin., serial 2530-U. Miller, No. 2 Brown & S. pl. cone. Miller, pl., No. 15 Garvin, 42x10 x21".

Miller, No. 4 Ohio, table 101' Pipe machine, 2" Robbins, bench, motor 1/60.

motor 1/00.

Pipe machine, 12" Cox., b. d.

Pipe machine, 16" Wieland, m. d.

Planer, 24"x24"x6' Gray, 1 head.

Planer, Gray, 56x48x10', 4 heads.

Polishing stand, 3 H.P.US., 3/60/220. Press, arbor 30 ton Lourie, Hyd.

Partial List. Get Our New Complete Stock List.

55 Water St., Pittsburgh, Pa.

ress 77 Bliss, T. R., 10" str. dbg. Press, bench, No. 100-A. W-F., Wt. 275 ibs.

Press, foot,1-A Bliss-Con. 400 lbs. Press, OBI No. 2 Toledo.pl, 34" str. Press, OBI No.21 Bliss, 1"&2"st.(3) Press, No. 782 Bliss T. R., 10" str. Press, Farrell D. C. bed 34x36"wgt.

13,700 lbs Press, P-3 Ferracute m. d. (3) Press, or gang punch, No. 6 Nia. 46". Press or shear, United ob., 3\frac{3}{2}" shaft, m. d. (2)

Pump, tent. 700 GPM., 4" disc. Pump, tripl , 14"x4"Worthington, b.d. Punch, triple combination Pels 16., m. d.

Punch & shear, 25x24 U. Buffalo, Punch and shear, No. 3 L. & A., § x§", 14" throat.
Punch and shear, No. 12 Badger combined, b. d.

Punch, & sh. hand, No. 3B. Beloit 5/16"x2".

Punches, hand No. 6 Kidder. Riveters, Shuster, \$"&3/16", belted. Riveter, No. 120 Grant, cap. \$", m.d. Saw, No. 10 Racine 9x9", belted. Saw, cold, No. 7 Espen-L., 18" belt. Saw, cold, No. 7 Espen-L., 18" belt. Saw, cold, No. 1 Newton, 41" belt. Shaper, 14" Steptoe, sba. Shaper, 14" Steptoe, sbg. Shapers, 14" Hendey, for m. d. Shaper, 15" Springfield, sbg; belt.

Shaper, 21" Smith & Mills. Shaper, 24" Barker b. g. V-ram, b. d. Shaper, 24" Barker D. g. 7 van Shaper, 24" G. & E motor 220 volt.d.c. Shaper, 24" American D. g. crk., b d. Shear, angle 8x8x14" H & J. m.d. Shear, angle 6x8x4" Kling., m. d. Shear, squaring, power 48"x14 ga. Shear, squaring, power 48

Shear. Rotary 232 Bliss 14 ga. Shear, throatless 18-M Marshalltown, motor drive.

town, motor drive.
Shear, bar 3' United, 24" blade, m.d.
Shear, squaring, power 30" xl8 ga.
Shear, squaring, power 42"xl8 ga.
Steam turbines, 100h. p. 900 rev (2).
Straightener, 4" 220' Shuster, cut off.
Testing mach, 100 Ton Oison, com.
Tearing machines 60.62 1000 lb. hand. Tiering machines 600&1000 lb. hand. Turret lathe, 18"x3\$" Libby, m. d Truck, Cowan Transveyor 5000 lb. hand.

Valve refacer, Kwik-Way, cabinet base, m. d.

Welder, Arc 300 amp. 3/60/220. Welding & cutting generator, Carbic Wheel press, 60 ton 34"x81, b. d.

FOR SALE BY

United Machinery & Supply Co., 1241 Walton Ave., St. Louis, Mo.

Brake, 12'x18ga, Robertson, toggle. Grinders, U. S., a. c., m. d. 18" & 24" Hammer, 50 lb. Baudry, Miller, No. 6 Becker. Punch, horisontal H. & J.

Rolls, corrugating 12' Bertsch. Seamer, 48" Niagara. Shear, circle and flanging, 10 ga. Shear, Lenox * cap. splitting. Threader, Oster 2" m. d., a, c. dies.

FOR SALE BY

E. L. Klauber Machinery Co.,

Drills, No. 00 bench precision. Gauges, dial thickness, pedsti. \$10ea Grinder, No. 3 Bath, universal with all attachments. Lathes, Nos. 0, 1, 2, 3 & 4 Precision. Lathe, 24"x12' wood turn, iron bed.

320-322 South Third St., St. Louis Miller, No. 00 vertical bench.

Millers, No. 1 Knight vertical. Miller, 16"x55" Newton horizontal. Press, straight side, 56 tons. aws, 4x4: 6x6 Racine H. S. Shapers, 16"-18"-20" Ohio, American.

FOR SALE BY

Failor-Strafer Machinery Co.,

Conveyor and chain, 360', 4" links, Drill, Amer. 3' sens. radial t. a. Drills, Avey Nos. \$ 1. 1\$, bench. Drills, Avey No 3, 4 spdie., pwr. id. Drill, No. 121, Baker, h. p. cap. 1\$". Drill, Cinn. 32" s. p. gear box. Drill, Cinn-Bickford 4' radial. Drill, 24" Hoeffer gang, 2 spdle. Drill, 24" Hoeffer gang, 2 spdle, Drill, 9" Sipp, h. s., b. b. cap, 4". Grinder, No. 14 P. & W. surface b.b. Lathe, 24"x24" Acme tur. chucking. Lathe, 3"x36" J. & L. bar & chuck'g. Lathe, (2) Le Blond h. d. eng. 17"x6'.

136 Liberty St., New York

Lathe, Sloan & Chase bench type. Magnetic seperator, Dings. Miller, No. & Becker, vertical. Miller, Becker, duplex Lincoln type. Miller, B. & S. No. 5 vert., rotary. Miller, B. & S. No. 24 plain. Miller, Cinn. No. 3 plain, s.p.d. Miller, Garvin plain No. 14. Oil grooving machine, Fischer, Saw, Higley cut-off.
Sq. shear, 30" Bliss, cap. 5/16".
Sq. shear, 8'x14 ga. Geo Ohl., b. d.
Surface plate, 27"x40"x4" high.

.

FOR SALE BY

Bradford Machine Tool Co., 657 Evans St., Detroit, Mich.

Ball crank machine, Garvin special. Boring machine, No. 2 Espen Lucas horizontal. Drill, 29" Cincinnati upright, Drill, 22" Bickford upright. Drill, 22" Superior upright. Drill, 24" Blaisdell upright, Drill, 30" Bickford upright.

Drill, 5' Fosdick plain radial, Gearcutter, auto. B&S No. 4 hvy.48. Hammer, Bradley 50 fb. helve. Lathe, 16" 16' quick change gear. Lathe, 18"x6'q.c g ,5-step cone,s.b g. Lathe, 18"x6' heavy pattern, positive

Lathe, 18"x8" heavy pattern, positive grd, feed.3-step cone, siliding d.b.g. Lathe, 18"x8' heavy pattern, q.c.g., 3-step cone friction d.b. g. Lathe 18"x8' q. c. g., 3-step cone, friction d.b. g., and turret on bed. Lathe, 18"x8' belt feed with carriage

turret.

Lathe, 18"x10' heavy pattern, q.c.g.

3-step sliding d. b. g.
Lathe, 20"x10' positive geared feed,
3-step cone, friction d. b. g.
Lathe, 24" x 10' Blaisdell, 4-step

Lattle, 24° X 10° Blatscii, 4-step cone, 8, b. g.
Lathe, 24° X12° positive geared feed,
3-step cone, fric ion d. b. g.
Lathe, 24° X12° positive geared feed,
3 step cone, friction d. b. g.
Lathe, 24° X12° loose change gear,
when the thing 4.9° X12° loose change gear,

raised to swing 42"

Lathes, turret, J. & L. 2"x24" flat turret and die head (2). Milling machine, No. 4 Cinc. plain. Screw machine, Cleveland - auto.

model A. Shaper, 24" Walcott, Surfacing machine, 14" vertical, Peerless No. 4.

Tool grinder, Cincinnati No. 12.

FOR SALE BY

Wigglesworth Machinery Company
199 Bent Street. Cambridge, Mass.

Boring mill, No. 21 Lucas horizontal.
Boring mill, 42" King vertical.
Grinder, No. 14 P. & W. model B.
Send for Complete Stock List.

FOR SALE BY

Standard Machinery Co., 347 Indiana Ave., Grand Rapids, Mich.

Automatic, 14" Gridley Model F. Boring mill, 42" Bullard vertical. Boring mill, 34" Colburn vertical. Boring mill, 24" Lucas horizontal. Drill, 20" Hoefer 4-pindle gang. Drill, 18aker No. 321 heavy duty. Furnaces, Detroit Electric (4).

Lathes, 9" Porter-Cable Mfg, Lathe, 24"—42"x12" Fifield c. h. Miller, model C-1 Becker hvy, vert. Pipe machine, 8" Williams. Presses, Waterbury Farrel S. S. 7" shaft, 30" between uprights (2). Welder, No. 259A12T. Gibb apotna.

FOR SALE BY

Lang Machinery Company, 28th St. & A. V. R. R. Pittsburgh, Pa-

Air compr., 12"x19"C1sgo."nsb" m.d. Automatics (4) No. 5-A Potter & J. Automatics, 22" cone 4 spdl. m.d. d. Blower, No. 5-Sturtevant 8\footnote{spd. m.d. d. Boring mill, 6" Bullard, 2 Hds. m. d. Bor, mill, 8\footnote{spd. m.d. d. Boring mill, 6" bar N. B. P. dbl. post. Bor, mill, 4\footnote{spd. m.d. b. d. Bortong mill, 6" bar N. B. P. dbl. post. Bolt cutter, 1\footnote{spd. m.d. b. d. Brake, leaf, No. 227 Dreis & Narschke. Drill, rad. 2" Foodick, t. a., b. d. Brill, rad. 2" Foodick, t. a., b. d. Drill, rad. 3" Amer. tr., pur. m. d. Drill, rad. 3" Amer. tr., pur. m. d. Drill, rad. 3" Amer. tr., pur. m. d. Drill, s. pur. 3. 2" Amer. tr., pur. m. d. Drill, s. pur. s. 3 p. Reed, b. d. Drill, 4 sp. No. 2" Foote-Burt, m. d. Drill, 14 sp. No. 2" Foote-Burt, m. d. Drill, 14 sp. No. 2" Foote-Burt, m. d. Drill, 14 sp. No. 2" Foote-Burt, m. d. Drill, 16-sp. No. 1" Bliton, b.d. (2) Gear millers, No. 1 Bliton, b.d. (2) Gear millers, Standard, 4\footnote{spd. m.d. d. Grinder, disc, dbl. 18" Diamond, b.d. Grinder, flex, shaft \footnote{spd. m.d. m.d. d. Grinder, s. migle and double end. Grinder, flex, shaft \footnote{spd. m.d. M. d. Grinder, s. m.d. and S. M. d. d. Grinder, s. d. Golb. Brite. Keyseater, No. 2 Baker, so. d. Lathe, 14" 25" Hendey Tie B. t.a. b.d.

FOR SALE BY

Chas. E. Wain Machinery Sales, 7800 Mack Ave., Detroit, Mich. Reaming mach. Footburt..... 100. Tapper, No. 2 Garvin........ 180. 2 to 3 tons of good leather Grinder, No. 1 Ciu. T&C \$ 75. Grinder, 40" knite...... 190. 225. 85 belting.

FOR SALE BY

J. Bleser Mfg. & Machy. Co.,	16th & Madison St., Springfield, Ill.
Air comp. outfit 2 H P auto\$ 75 Angle shear, E-1 Badger245 Electric drill, 18" 3 ph	Radial drill, 5' Bickford 195. Steam pump, Duplex 12x7x10. 75.

FOR SALE BY

Aaron Machinery Co.,	176	Lafayette Street, New York, N. Y.
Drills, radial, 2-4' American. Engr. mchs., Gorton, 1A, 1D, Flexible shaft. † h. p. Strand., 2 Grinder, No. 35 Heald. Lathe, 16"x8' Monarch. Pipe machine, 2" Landis	50. 450. 250.	Power press, V. & O. No. 2½\$325, Punch, Pels No. 13 combination 750, Screw mche, W. & S. No. 1 175, Shaper, 20" Amer. tilting table 575, Shaper, 16" Stockbridge 250, Shear, Geo. Ohl, 10 foot 10 ga.

FOR SALE BY

M. A. Wertman Machinery Co., 623 Penton Bldg., Cleveland, Ohio Automatic, 2-24" B Cleveland, m. d. Drill, Barnes 20" camelback. Drill, Barnes 20" camelback.
Drill, Rocktord 26" sliding head.
Gear cutter, No. 4-36" B. & S.
Grinders, B. & S. No. 2 surf. rebuilt.
Grinder, Norton 6x32" (2). Grinders, Norton 10"x50"

Miller, B&S No. 2 plain cone type. Miller, B&S No. 14 plain, cone type. Miller, Superior hand, A I cond. Nibbler, Campbell No.2, 24"thrt.md. Oil extractor, Curti No 400, 1.8 bu. Saw, Atkins 8"x8" Kwi-cut. Swager, No. 3 & No. 4 Langelier,

FOR SALE BY

Ott Machinery Sales, Inc., Automatics. Cleveland Model A 3, 14, 28, 24, 24; Fay 14"x19". Acme Nos. 53, 54, 55, and 76; Gride 4 4 9d, 4", 14", 14" 24" & 24". Borring miles, Bullard 52" 2 swivel heads and 24" rapid production. Drills, h. s., b. b. Henry & Wright No. 2, 2, 4 and 6 spindle.
Drills, 34 American Plain Radial.
Drills, 5 Bickford Plain Radial. Gear shapers, Fellows Nos. 6. Gear generators, Gleason 15" spiral bevel; roughers and finishers; Barber-Colman No. 3 and 12; Lees Bradner No. 1 & 5A.

Grinders, Brown & S No. 11, s.p.d.

B. & S. Nos. 14 & 16 pl., m. d.,

No. 3 B&S univ. Heald No. 50, 55,

548 Second Ave., Detroit, Mich. 65, 70, & 75; Landis 10x36 plain s. c., m. d.; Norton 6x32, 10x36 & 14x50; Norton, type A, 18"x55" m. d.; Van Norman No. 9 internal. d.; van Norman No. 9 internal. Lathes, American G. In. 16"%"; LeBlond 16x6; Flather. 24"x10". Hendey 16"x6" T. A. Yoke Head. Lathes, turret. W. & S. No. 2A and 4 geared head; W. & S. Nos. 4 and 6 cone; J. & L. 2"x24" and 3"x36" dble, spdie. Steinle 24"—84" hole. Milling mehs., B. & S. No. 2B hvy. plain; Kempsmith Nos. 12 & 33 Mig.

Planers,48"x36"x8' Cinti. 2 hds.,m.d. Presses, Ferracute Pl. 2, 3, D G 53 and D D G4 cam; Bliss No. 29 arch: Metalwood 30 ton hyd. Many more good tools .: Your inquiries solicited.

FOR SALE BY

Rosenfeld Machinery Corporation, 950 W. Lake St., Chicago, Ill.

Bandsaw, metal cutting, 6" Milband. Blowers, No. 20 Connorsville, (2). Broaching machine, 3B LaPointe. Gear hobbers, No.12 Barber-C., (2). Hack saws. No. 2 Marvel, 6x6 high speed, Racine.

athes, turret, Potter & J. (2). Mill, Becker vert, model C S., s.p.d. Milling machine, No. 20 Oesterlein plain.

Shear, 8' Kuchard foot power.

FOR SALE BY

The O'Brien Machinery Co.,

Band saw, 42" American, V belt, m.d. Bending roll, 10' Bertsch, pinch type, drop end, belt drive, 3/16" cap. Boring mill. 24" Bullard, rap. prod., threading attachment.

Crane, 36' Gantry, 20 ton, hand oper. Drill, 6' Mueller radial, mtr. dr. Drill, D2 Colburn, 3" cap. Gear hobbers, 18" & 24" Gould & E.

Grinder, No. 103 Rivett, internal holecap, 1/64" to 2". Grinder, No. 11 B & S Plain, 6"x32"

s. p. drive. Hammer, 800 lb. Erie, steam forging. Hammer, 1100 lb. NBP. steam forg. Hammer, 2000 lb. Chambersburg double frame steam. Lathe, 15"x7" Springfield, motor dr.,

taper, collets & chuck. Lathe, 30x24 New Haven, belt.

113 N. Third St., Philadelphia, Pa.

Lathe, turret, No. 1 B&Shand screw machine, belt drive, lot of equip. Lathe, turret, 3A Warner & Swasey

Latne, turret, 3A warner & Swasey S. P. drive, cap. 34".
Miller, No. 1D B&S Univ., table 36"xlla" cone drive.
Miller, No. 3 LeBlond plain, belt drive, table 12"x66", quick chge.
Miller, No. 2 Kempsmith, plain, table 10"x45", belt drive.
Miller, No. 5 Cincinnati plain, table

76"x19", s. p. drive. Miller. No. 3 Cinn, vertical, table 58"x13#", SP dr.

Pipe machines, 2, 4, 6, 8 and 12" belt and motor drive.

Shapers, 14, 16, 20 & 24"various makes Shear, 30" throat Quickwork rotary, 3/16" capacity.

FOR SALE BY

Harry Dalitz.

701 E. 96th St., Cleveland, Ohio MY MACHINERY, TOOLS AND MOTORS GUARANTEED

AS REPRESENTED Automatic screw machines, Model B Cleveland, ‡" to ‡"

Automatic screw machines, Model B Cleveland, ‡" to ‡"

(Above machines have been in use about 30 hours.)

Each \$3 to 15. to 3

Each \$12 to \$45. Drills, carbon, brand new, No. 4 Morse taper, sizes 1-13/16", 1-27/32 Kach 8 1-21/32", your choice ...

each \$3 50. All cutters high speed steel Metal saws, Atkins sil 'er steel, 14"x5/32"x11", 116 teeth for Higley, etc.

Motors, guaranteed A-1. Allis- Chalmers, 3 ph. 220-v., 60 cy. 900 r. p. m. with compensator, base and pulley, like new \$145; Wagner synchronous,

Just a few of my bargains listed here.

FOR SALE BY

W. E. Brandt Mach'y, Sales, 513 Empire Bldg., Pittsburgh, Pa.

Brake, 10'x3/16" D.&K., press type. Boring mill, 10' Niles, 2 heads. Bulldoser, No. 4 Williams & White. Forging machines, 2", 3", 5" Nat'l. Forging machines, 2\frac{1}{2}" Ajax.

Gear generator, 11" and 18"Gleason. Gear generator, 11° and 18° Gleason. Keyseater, No. 2 Baker, 2" keyway. Roil, bending 10°x12" Cleveland. Roll, bending, 8°x2" H. & J. type. Shear, 10°x2" H. & J. No. 6.

FOR SALE BY

The Nutmer State Machinery Corp.

1041-1051 State Street

Drill, Pratt & Whitney No. 12, Mult Spdie., Rec. head. Grinder, Brown & S. No. 2 universal. Grinders, B&S No. 11 pl. c/s dr. (2) Grinder, Pratt & W. M.", b.b., vert. Grinder, Ingersoll cutter. Miller, Le Blond No. 3H heavy duty,

Universal complete. Millers, Pratt & Whitney 12" auto-

New Haven, Conn. matic (5). Press, Toledo No. 58, S. S. geared,

auto, friction clutch. Press, Toledo No. 54 Aspecial, S.S.,

motor driven. Press, Standard 500 lb. auto. drop. motor driven.

Screw machine, Gridley 12", ModelG automatic

200amp, Hobart Bat. Charg. 7.5v. 1750 36" Crescent Band Saw. 1/2" saw. 2000 lb. B. & S. Brd. Drop Hammer. 5000 lb. dbl. frame N.B.P. Steam ham. 1 100 lb. sgl. frame steam Forg. Ham. 24º Gould & Eberhardt Shaper. 26 x 11 Wickes D. B. G. Hvy. Duty 12"x 10" Chi-Pneu. M.D. Air Comp. 10'x 1" Wickes Bend. Rolls Pyr. Type. 8x8x1 H. & I. Angle Sh on turntbl. 10'x 16 Ohl Pow. Sq. Shear, B. D. 6" Merrell pipe Cutting & Th Mch. Lennox Rotary Bevel Shear, 36" cap.

84" Sellers Vertical Bor. Mill, B. D. 84' Sellers Vettical Bor, IVIII, D. L. 30' Bullard Mill, I urret Head, 48x1' L.& A., Pl Sh.on turntble, m d. 300 amp. Lin, Port. DC Arc Welder. 400 Hf new Water Tube Boiler, 10tonHand pwr.trav.Crane40'8' span. 60x48''x14' 3 head Niles Planer. 400 KW AC Steam Generating Set. 204. 10t Langla Late, and Micropic Sec. 204. 10t L 20°x 10' Hendey Lathe dbl.friction (S. No 3 B. & S. Automatic Gear Cutter.
3½ Ajax iron bed Forg. & Upset Mch.
72 Bullard Vert. Bor. Mill D.C.M.D.
Type "F" L & A Ver. Bar Shear.

Lathes 66"x30' Johnson, cone dr., hvy, duty. 60"x30' Pittsburgh, Motor Drive. 28"x17' Chard, motor drive. 24"x12' Lodge & Shipley, Grd. Hd.

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120"x84"x18" Betts, Rap. Trav., M.D.
64"x84"x20" Bement M..4 Hd., M.D.
72"x72"x12" Cinc., 3 Hds., M.D.

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10' Niles, 2 swivel heads. 60" Bullard, Rapid Traverse, M.D.

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36" Bullard Rapid Production 53° A4° Niles-Bement-Pond Vert. 44° Niles-B. P. Vert. Heavy Duty. 53° Niles B Pond Rapid Traverse.

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62" Niles Vertical.
62" Niles Vertical.
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90" Betts Vertical.
96" Niles B Pond Rapid Traverse.
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18 ** x B and 16 Le Blond Cone.
18 ** x B and 16 Le Blond Cone.
28 ** x B and 16 Le Blond Cone.
28 ** x B and 16 Le Blond Cone.
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Brakes, power, Chgo, St., 10¹ 3/16⁸,
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Saws, friction, Nos. 0 & I Ryerson.
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16º Cincinnati, gear box.

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20", 25" Smith & Mills, cone.

24^s Stockbridge, m. d. 24^s Queen City, cone.

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Hilles & Jones Style J Single End 30* Open Throat H. D. Punch m. d. with 30 H.P., A. C. motor, capacity 4* hole thus 1½* steel. Speed 22 strokes per minute, has 3* stroke. Weight 86,000 lbs. Very late type practically new.

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No. 4120 Stoll Power Squaring Shea m, d., cap. 10¹ by 3/16².

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- 30° Gisholt Vertical, I head p, r. t.
- 36*, 42* Bullard Rapid Production 2 heads on rail.
- 36* Colburn Vertical, 2 heads.
- 37º Niles Vertical, 2 heads, m. d.
- 51 Niles-Bement-Pond Vertical, m. d. a thru gear box.
- 21/2* bar Cleveland Horizontal.

PLANERS

- 24"x24"x6' Gray, 1 head, belt.
- 24" x24" x6" Ohio, I head, bek. 24" Coulter Open Side Crank, s. p. d.
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- 36"x36"x12" Fitchburg, 3 heads, m. d., 42"x42"x12"Niles-Bement-Pond Heavy Pattern, 4 heads.
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No. 21 Blis Consolidated.

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No. 54A Toledo Special No. 94 Bliss Consolidated.

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208x101 Boye & Emmes, cone. 208x61 Hendey Geared Head, m. d.

18'18' Lodge & Shipley Selective Head, s.p.d.

18°x8' Greaves-Klusman, cone.

17°x8° LeBlond, cone. 16°x14° Lodge & Shipley Selec. Head, m. d. taper.

m. d. taper. 16"x12" Prentice Geared Head, s. p. d. 16"x10" LeBlond, cone, taper.

16°x6' Hendey Yoke Head, cone. 14°x6' Hendey Geated Head, taper.

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LATHES

No. 5 Center Drive Niles Car Wheel
Lathe, m. d., A. C. motors, capacity
42"x96".

42°x20° Putnam Geared Head, m. d. 36°x29° Johnston, cone.

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30°x14' Lodge & Shipley Patent Head. s. p. d.

30"x11' American, cone.

29° raised to 32°x12° LeBlond, cone. 24°x12° Schumacher-Boye, cone.

24°x12° LeBlond, come. 24°x10° Boye & Emmes, come.

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24°x10° Greaves-Klusman, cone. 24°x10° American, cone.

24"x10" American, cone. 24"x8" Hendev Yoke Head cone. 22"x10" L. & S., Selective Head, cone.

20"x12" Lodge & S. Patent Head s.p.d. 20"x10" Hendey Yoke Head cone.

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48^a Cincinnati Pl. Automatic, apur dr. 48^a Cincinnati Pl. Automatic, worm dr.

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National Standard Spindle.
No. 33 Kempomith Mfg., s. p. d.
6-802 Prom & Whitney Thread

6x80^a Pratt & Whitney Thread, m. d. 48^a Oesterlein Tilted Offset, m. d., Timken Bearings, National Standard latest type.

Ingersoll Vertical m. d., 40° rotary table, C66A Newton 3 spiedle Continuous Miller, 48° dia, table,

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39"x11', 20' American geared head,
39"x11', 20' American geared head,
34"x23' Johnson, T. G.
6"x21' Putnam t.g., m. d,
Millers (Plain and Universal)

Nos. 9, 14, 2, B. & S. Nos. 2 & 3 Cinn, h. p., s. p. d. Nos. 2-B, 3-B Milwaukee. Nos. 2-B, 3-B. 4-B B. & S. Nos. 4 Cinn. h. p., s. p. d.

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Nos. 2 & 3 Cincinnati h. p.
No. 3-B, 4 Milwaukee.
No. 5-B Becker. No. 4 Recker Planers

Hances 24"x24"x12" Gray, rev. m. d. 30"x30"x14" Gray, rev. m. d. 30"x30"x8", 18" Cincinnati. 36"x38"x8, 18" Cincinnati. 36"x38"x12" and 24" Gray. 36"x35"x14"-24" Cleveland o.s. 42"x42"x30" N-B-P, Rev. m. d. 48"x46"x14" Liberty, openside. 60"x48"x16' Gray max. service. 72"x60"x16' American.

Shapera 16" Walcott. 16" Stockbridge. 29" & 24" Gould & Eberhardt.

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(2). Drill Radial, Bickford No. 3-6'

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cherrying attach.
Die Füer, Barry No. 3.
Grinder, Ingersoll Cutter 24*x41/2*

Grinder, Landis 15x8 Hydraulic Int. M.D. Grinder, Van Norman No. 3½

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Grinder, B. & S. No. 12 plain.
Grinder, Landis No. 1 plain.
Grinder, Gardner No. 6 dbl. disc

Grinder, Beely No. 1 dbl. diec M.D. Grinder, Heald No. 60 Int. Keyseater, Mitts & Merrill No. 3

with broaches. Lathes, Hendey 18x8, 16x6' taper attachment.

auacnment. Lathe, Sidney 16⁴x7¹ qk. chg. Lathe, Advance 24⁴x8¹. Lathe, Porter-Cable 9x14. Lathe, McCabe dbl. spindle 26—48x12¹.

Lathe, Dreses Fox. Lathe, P. & W. Ix18 autom. Miller, K. & T. No. 1-A S. P. D. Miller, Hendey duplex. Miller, Becker large hand. Miller, Ingersoll 48x24x12, 3-hds. M. D. Lathe, American 18°x8' qk, chg. Lathe, P. & W. 1x18 autom.

Miller, Ingereoll 24x24x10.

Miller, Garvin No. 15 vert. Miller, Kempsmith No. 4 mazi continiuous.

continuous, Planer, Gray 30x30x8, Press, Toledo No. 30 Bench, Press, Bliss No. 61 Reducing, Press, Zeh & Hahnemann Percus-sion power No. 68, Press, Bliss, No. 68 dbl. action.

Press, American Can No. 5 Inc. F. W. T.

Press, Bliss No. 22 Inc. Press, Ohl's 12' power. Pipe Threader, Oster 2°. Punches, Rock River No. 2 Univ.

combination. Roll, 10' power, cap. 14° C. P. Roll, 10' power, cap. 14° C. P. Roll, Hendley No. 3-E-6' slip,

cap. 1/16. Riveter, Hanna pinch bug, 40-ton 8º throat.

Saw, Klemm No. 2 metal tilting. Shear, Kent 4' power, cap. 10-ga.

Shear, Niagara No. 230 power, cap. 16-ga. Shear, Pexto 36* gap. 18* foot. Shear, Badger, No. 27 splitting. Shear, Quickwork rotary 60*, cap.

14 ga.
Shear, Yoder 6'-14 ga.
Shear, Yoder 6'-14 ga.
Shaper, Ohio 24" bk. grd.
Shaper, Smith & Mills 26" bk. grd.
Turret lathe, Warner & Swasey

No. 3-A chucking.
Turret lathe, W & S power cross feed, F. H.
Turret lathe, W & S No. 6 F. H.,

P. F. to turret (6).
Turret lathe, W & S No. 4 F. H.,
P. F. to turret (6).
Turret lathe, W & S No. 2 plain

P. F. to turret. Turret lathe, Bardons & Oliver No. 8 power cross feed P. F. to turret. Turret lathe, Greenlee flat (2).

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Boring mill, 42" Colburn 2 heads.
Boring mill, 42" Colburn, (2).
Boring mill, bor. 4\(\frac{1}{2}\) bar Betts
Boring mill, bor. 4\(\frac{1}{2}\) bar Betts

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Hammer, 80 Perfect.
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Lathes, 18"x8" L. & Blond QCG cone.
Lathes, 16"x10" Monarch QCG cone.
Lathes, urret, No. 3 & 7 universal Bardons Oliver.

Lathe, 27"x14' Le Blond.
Lathes, 28"x12 Fiather, q. c. g.
Lathe, turret No. 6 Woods, tilted.
Lathes, 3 Gridley 28", Model F., 4 sp.
Miller, Pratt & Miltrey spline.
Miller, No. 4 Brown & S. plain.
Miller, No. 3 Hendey, plain.
Miller, No. 3 Hendey, plain.
Miller, No. 4 How thread.
Miller, No. 4 L. S. band.
Millers, No. 1 L. S. band. Millers, No. 1 U. S. hand Millers, No. 1 U. S. hand, Millers, Ingersoil, 27'x24'x10'. Planer, 36x36x12 W. & P., 2 heads. Planer, 36x36x8 Cinn. 1 head, Planer, 36x36x8 Cleveland openside, Planers, 60'x48'x10' Gray, 2 heads. Press, No. 91.C Toledo, Press, No. 2-3 & 4 Marshalltown, o. b. i., new.

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Saw, No. 2 Marvel, Saws, 6x8 Acme, Shaper, 1st", 2st", 2st", sgl., pulley dr., Shear, 3' Niagara, 16 ga., Shears, 3 Guitting, \$\frac{1}{2}\$ cap. Shears, aquaring Niagara \$\frac{1}{2}\$ ga., Shears, 34Wiagara ring& circle 1/3' Shears, 48" Bertash aq., 16 ga., Seamer, 40mble Bliss No. 5.

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Griader, No. 34 Gardner Ubie. Disc. Opposed Type, Auto. Feed, M. D. Grisders, No. 13 B. & S., M. D. (3) Grisder, P. Tatt & Whitney Surface, M. D., B. B. spindle. Grisder, No. 7½ Gardner Disc, M. D. Grisder, No. 3 Abraive W. D. Grisder, No. 3 Abraive W. D. Grisder, Heim Centerless, M. D. Grisder, Heim Centerless, M. D. Grisder, No. 72 Hvd. 11t. Heald.

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Press, No. DG53 Ferracute (3). Press, No. 21 Bliss Cons. Horning (4).

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16°, 20°, 24° Gould & Eberhardt
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16°, 20° and 24° G. & E., cone drive.

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24º Cincinnati Automatic.
No. 3 Cincinnati Universal.
No. 4 Cinti. High Pwr. Univ. S.P.D.
No. 2 & 3 Kempumith Plain, M. D.
No. 3 LeBlond H. D. Plain.
No. 3 Kempumith Universal.
58 Becker Vertical Mill.
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18º Cincinnati Plain Mig. Miller.
Briggs Manufacturing Miller.
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No. 1 Knight Miller and Oruller.

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30"x30"x8' American two heads. 30"x30"x16' Carry, two heads. 24"x6' Ohio. 24"x24"x14' Gray, box table. 42"x42"x10' Cleveland Openiide, 3 heads, A. C., M. D.

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13/64	1.40	.56	23/32	2.60	1.04
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1/4	1.40	.56	25/32	2.80	1.12
17/64	1.50	.60	13/16	2.80	1.12
9/32	1.50	.60	27/32	3.10	1.24
19/64	1.50	.60	7/8	3.10	1.24
5/16	1.50	.60	29/32	3.40	1.36
21/64	1.60	.64	15/16	3.40	1.36
11/32	1.60	.64	31/32	3.70	1.48
23/64	1.60	.64	1	3.70	1.48
3/8	1,60	.64	1 1/16	4.00	1.60
25/64	1.75	.70	11/8	4.30	1.72
13/32	1.75	.70	1 3/16	4.60	1.84
27/64	1.75	.70	11/4	4.90	1.96
7/16	1.75	.70	15/16	5.20	2.08
29/64	1.90	.76	13/8	5.60	2.24
15/32	1.90	.76	17/16	6.00	2.40
31/64	1.90	.76	11/2	6.40	2.56
1/2	1.90	.76	19/16	6.80	2.72
33/64	2.00	.80	15/8	7.20	2.88
17/32	2.00	.80	111/16	7.60	3.04
35/64	2.00	.80	13/4	8.00	3.20
9/16	2.00	.80	1 13/16	8,40	3.36
37/64	2.20	.88	17/8	8,80	3.52
19/32	2.20	.88	1 15/16	9.20	3.68
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5/32	.30	.63	3/4	.90	1.69
3/16	.30	.63	25/32	1.00	1.81
7/32	.40	.75	13/16	1.00	1.81
1/4	.40	.75	27/32	1.05	2.00
9/32	.45	.81	7/8	1.05	2.00
5/16	.45	.81	29/32	1.15	2.22
11/32	.50	.94	15/16	1.15	2.22
3/8	.50	.94	31/32	1.25	2.50
13/32	.55	1.06	1	1.25	2.50
7/16	.55	1.06	1 1/16	1.30	2.81
15/32		1.19	1 1/18	1.40	3.12
1/2	.65	1.19	1 3/16	1.50	3.44
17/32	.70	1.31			
9/16	.70	1.31	1 1/4	1.55	3.82
19/32	.80	1.44	1 5/16	1.65	4.22
5/8	.80	1.44	1 3/8	1.70	4.69
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No. 14 COCHRANE & BLY COMB. Mill and Shaper, m. d.; No 3S CINCINNATI Univ. Milling Machine, S. P. D., fully equipped; 16*x12' SIDNEY Grd. Head Lathe, M. D. Taper Attachment.

Internal: No. 260 Heald Rotary 16" chuck; No. 2 Norton T. & C.; 12" P.&W. Surface; No. 3 W.&M. Surface.

Hacksaws, No. 5 Marvel, M. D .; 6x6 Peerless Shaping, M. D. Lathes, 14" to 30" Lodge & Shipleys, q.c.g.; 16"x10' Hendey, taper att.; 16"x10' Seneca Falls, q.c.g.: 19"x8'

Le Blond q. c. g. taper att.; 16"x8 Monarch q.c.g.; 20"x8' Monarch, q. c. g.; 20"x8' American q. c. g.;

draw; No. 74 Bliss S.S.; Nos. 4A Bliss Horn. Screw mchs., No. 6 W. & S.; No.1B

Foster.

Foster. Shears, 30" Bertsch corrugating: No. 05 Niagara ring & circle, m. d. Spinning Lathes, 22"-44" Gap Ball Bearing.

Welders, arc, 200 Amp. USL.
Welders, butt, IS K. W. Toledo.
Welders, spot, new 5 K. W. Dyer;
25 K. W. Toledo.

Send For Our New Stock List. VICTOR MACHINERY CO., 130-132 S. Chinton St., Child Co., ILLINOIS

BORING MILLS

10 ft Niles. 60° Cincinnati. 48° Colburn. 42° Gisholt.

42º Bullard. 4½ bar Niles - Bement - Pond Horizontal, Table Type, Duplex Control

MILLING MACHINES Nos. 5, 4, 3, 2 Cincinnati, Plain. No. 4 Cinc. Rectangular overarm. No. 3 Kempsmith Plain. No. 15 warvin Vertical.

No. 3-B Milwaukee Vertical. Motor in base, P. R. T. No. 2 Cincinnati vertical. No. 2 LeBlond Universal.

RADIAL DRILLS 81 Cincinnati-Bickford Enclosed Head, M. D.

LATHES

22"x16' Whitcomb Blaisdell. 20"x8' American. 20"x8' LeBlond. 42*x28' American 16 speed G. H. 36*x12' Lodge & Shipley. 32"x17" Houston Stanwood & G.

MISCELLANEOUS Drill, No. D4 Colburn Heavy Duty; 36° Cincinnati-Bickford Tapping. Gear Generators, 8° Gleason Spiral Bevel.

Gear Generators, 5° Gleason Spiral Bevel. Grinders, (2), No. 16 Blanchard B. D. 26° chuck; also with direct m. d. Grinders, No. 3 Bryant. Grinder, No. 1 Brown & Sharpe Universal. Screw Machine, 2¼° Gridley Model "F" 4-spindle. Shear, No. 2 Hilles and Jones Gate, 28° gap, 74° x½°. Turret Lathes, 3° x36° J. & L.—Bar and Chucking; 26° Libby. Turret Lathes, 3° x36° J. & L.—Bar and Chucking; 26° Libby.

SUN MACHINERY COMPANY, INC. 36 Van Vechten St., NEWARK, N. J.

REASONABLY PRICED TOOLS

No. 105 Bliss Consolidated Double Crank Inclinable Press.

12"x72" Landis Self Contained Grinder.

No. 2B B. & S. Plain Miller, single pulley drive.

No. 3H LeBlond heavy plain miller.

24"x151 American Tool Works Q.C. Lathe and Taper.

36" Cincinnati BG slid. head drill, tapping attach.

24" Bullard New Era.

No. 2 and 4 Milholland B G Frict, head screw machines.

60 lb. Bradley Helve Hammer.

No. 5 Cleveland Bar Shear - cap. 4"x4".

60" Kutscheid Shear for 16 ga.

4º Saunders pipe machine & dies.

Several nice Cleveland Model A automatic screw machines from 3/8" up to 33/4" capacity.

Complete stock of new Marshalltown presses on hand,

A. D. White Machinery Co., 108 N. Jefferson St., CHICAGO, ILL.

BRAKES—SHEARS & ROLLS 12' Robinson Press Brake \(\frac{1}{2}\)" L & A Square Shear. 42" \(\frac{1}{2}\)" L (evel and Shear. (Gap) 96" Chicago 3/16 Power Finger brk. 76" rower Sq. Shear 14 ga.
96"x\frac{1}{2}" Niles Plate Bending Rolls.
GRINDERS
Diamond surface 16"x48" table.

Double discgrinders—all sizes, No. 3 W. & M. 10x24" Surface, No. 13 B. & S. Universal, b. d. No. 1 Le Blond Univ. T&C Grinder, LATHES

LATHES

14"x6' Rockford q. c. Tool Room.
14"x 6' Lodge & Shipley q. c.
16"x8' Monarch geared head m. d.
15"x12' L. & S. sel. grd. head.
25"x12' Bridgeford, q. c.
30"x14', 36"x29' Niles S. B. grd. cone.
38"x14' American triple geared.
22"x12' Blope & E., cone head q. c.
36"x84' Ehlond q. c. motor drive.
PLANERS AND SHAPERS
20" G. & E. Shaper, Cone Prive.

20" G. & E. Shaper, Cone Drive, 20" Cincinnati Shaper Cone Drive, 36" 12' Gray Planer 2 Heads, WELDERS-SPOT 10 to 40 K. W. | 3' Bick., 3'6" & 6' Dreses s pgr. box.

MISCELLANEOUS Boring Mill, 60" vertical. 4 Spindle Barnes Camel back drill.
Bolt cutter, 14" & 2" Acme.
Gear cutters, Nos. 3, 4 B. & S.
Straightening rolls, 54" H. & J.
PRESSES No. 93F TOLEDO, Double Crank Single Back Grd, Tie Rod Frame, 24"Stroke, 114" Die Space, Bolster

MILLING MACHINES No. 2 B. & S. Plain Cone Drive. No. 34 Oesterlein plain, cone drive. No. 4 LeBlond Pl. 3 step S. Cone.

28" Stroke, 114" Die Space, Bolster 68:24, with Belted motor drive. No. 38C BLISS, Toggle Drawing Standard Specifications, belted a. c. m. d.; Bed 28:25. No. 281 FERRACUTE. Double Crank Back Geared Overhang Press. 3" Str. Belt Dr. Bed 22:24. No. 292B TOLEDO, Double Crank Gap Press. Bed 42" 312. No. 392C TOLE DO. Double Crank Solid Frame Single Back Gr Press Belt Drive, Stroke 3", Bed 42:30. 3" Bick., 3" 6" & 6" Dresses s pgr. box.

Jones-Buys, Sells and Trades-Send for Stock List

The Jones Machine Tool Front & Pike Sts., Cincinnati, Ohio

-: LUCAS LIST :-

6' American Triple Purpose Radial.
2—10"x72" Norton Plain Grinders, M. D.
14"x50" Norton Plain Grinder, M. D.
20"x96" Landis Roll Grinder, arr. M. D.
No. 1 Diamond M. D. Surface Grinder.
No. 13 Brown & Sharpe Univ. and Tool Grinder.
No. 4 Cincinnati Vertical Miller S. P. D.
6"x48" Pratt & Whitney Thread Miller.
30"x40" x10" D & H Openside Planer.
No. 196 Stoll Squaring Shear 14 ga. cap.
2—No. 3 A. G. H. Foster Turret Lathes.

J. L. LUCAS & SON, Inc. BRIDGEPORT, CONN.

WAREHOUSE REMOVAL BRINGS OUT THESE SPECIALS

We carry a tremendous stock of Machinery and Factory equipment.
Thousands of items too numerous to list. Send us your
inquiries. Every Item guaranteed.

FALK MACHINERY & SUPPLY CO., INC.

207

New Address

GUARANTEED TOOL

No. 454 New Britain. No. 454 New Britain.
Nos. 5A & 6A Potter & Johnston.

* & 2" Cleveland, Model A.

* Cleveland, Model B.

* Cleveland, Model M.

* Leveland, Mod. M. 4 spindle.

1" Cleveland, Mod. M. 4 spindle.

1" Cleveland, Mod. J. 4 double end.

* Leveland, Mod. J. 4 double end.

* Leveland, Mod. J. 4 double end.

1" Leveland, Mod. J. 4 double end.

1" Leveland Continuantic.

1" Level , No. 19 Brown & Sharpe.

BROACHES

No. 3 Oilgear hydraulic. No. 3L Lapointe hydraulic. 15 ton Oilgear vert. hydraulic. 10 ton Metalwood vert, hydraulic. Nos. 0, 2, 3 & 4 Lapointe. Nos. 1 & 3 American rack. 2 ton American vertical.

COMPRESSORS

706' Sullivan angle compound. 446' Bury 2 stage. 355' Ingersoll Rand. 265' Worthington. 265' Wortnington. 245' Ingersoll Rand. 136' Ingersoll Rand. 106' Chicago Pneumatic. 92' Ingersoll Rand. 67' Chicago Pneumatic. 40' Gardner vertical. 21' Ingersoll Rand vertical,

DRILLS
Nos. 216, 217, 318, 321 Baker.
1, 2, 2, & 4 spdl. Colburn No. 2 Mfg.
34, 4', 5', 6' and 8' Western radial.
21', 24', 28' Cincinnati.
400 spindles sensitive. All makes.
Nos. 6D, 11D & 18D Moline.
Nos. 6D, 11D & 18D Moline. 2 and 6 spdl. P & W deep hole. Nos. 11, 12, 13, 14, 30 Natro mult. 5 spdl. Detroit automatic.

GEAR CUTTERS Nos. 18H and 24H G. & E. hobbers, Nos. 1 and 5A Lees Bradner. No. 12 Barber Colman. Nos. 6 & 715 Fellows, 11" Gleason bevel.
Nos. 3 & 4 Brown & Sharpe auto.
36" Newark automatic. 28" G. & E. auto, spur & bevel. No. 2 Bilton automatic. Lipe 2 spdl, chamferer. 15" Gleason quenching press.

GRINDERS

No. 2 Cincinnati centerless. Nos. 70, 72, 72 A3 & 75 Heald. No. 12 Bryant internal. 26" No. 16 Blauchard. 12"x24" & 16"x48" Diamond surf. No. 2 Wilmarth & Morman surface. No. 2 Wilmarth & Morman surf 39"x72" Springfield surface. 6"x18" to 16"x53" Landis. 6"x32" to 14"x72" Norton. 12"x24" & 12"x60" Modern. 12"x18" & 12"x36" Cincinnati. 10"x30" Webster & Perks univ. 10"x30" Webster & Ferks univ. No. 2 Bath universal. No. 4 Brown & Sharpe univ. 20", 34" & 30" Gardner disc. No. 220 Badger opposed disc. 30" Ranson 1½ HP elec. snagger. 18"x48" Landis crank. 16"x32" Norton crank. 10"x34" Diamond face. 30"x84" Diamond face. 34" Aster auto. piston ring. 8" Arter auto, piston ring.

ENGINE LATHES

10"x8' Pratt & Whitney toolroom,

14"x8' Monarch,

16"x6' Monarch,

16"x6' Monarch,

16"x6' Motott Taper & relieving,

16"x8' Walcott Taper & relieving, 16"x8" Boye & Emmes.
20"x8" Monarch.
21"x18' LeBlond heavy duty.
22"x10' Davis. 24"x12' Lodge & Shipley. 26"x11' Wickes. 27"x12' Schumacher Boye.

TURRET LATHES Nos. 4, 6 & 3A Warner Swasey. Nos. 3 & 4 Foster.

Nos. 3 & 4 Foster. No. 4 Bardons & Oliver. 21" & 24" Gisholt. 18" Libby. 2‡" & 3" Jones & Lamson. 2 sudi. Jones & Lamson. 2*" Greenlee. 14" Cincinnati Acms. 1" Milholland. 24" Bullard vertical.

MFG. LATHES

8" Sundstrand Stub. 8" Sundstrand Stub.
9" Sundstrand Mfg.
11"x4' & 11"x6' Leblond Mfg.
11"x4' & 11"x6' Leblond Mfg.
Nos. 9 & 12 Leblond Multi-Cut,
20"x6' Wickes Mfg.
20"x11' Wickes crankshaft,
13"x6' Automatic threading.

MILES MACHINERY CO.,

PROMPT DELIVERY

BORING MILLS

24" Bullard, side head. 24" Bullard, side head.
30" Bullard, single turret.
34" Colburn, single turret.
36" Niles car wheel.
42" Detrick & Harvey.
60" Gisholt.
100" Betts. 24" Cleveland horizontal.

Binsee horizontal.

PLAIN MILLERS Nos. 2, 3 and 4 Cincinnati. Nos. 2 and 4 LeBlond. Nos. 14, 2 hvy., 3B & 4B B. & S. No. 4 Hendey. No. 3 Kempsmith.

No. 21 Rockford.

MILLERS UNIV. & VERT. No. 11 Rockford.

No. 2 Cincinnati. No. 2, 3A & 3A heavy Brown & S. No. 2 B. & S. vertical, No. 6 Becker vertical

MILLERS PROD.

18" Cincinnati plain Mfg. 18", 24" & 48" Cincinnati automatic. 24" & 48" Cincinnati duplex. No. 1 Davis & Thompson drum. A. 248" Newton rotary, 48"x48"x8" Beaman & Smith, 28", 37" & 42" Briggs, 48" Ohio tilted offset, Nos. 1 & 2 Kent Owens hand,

Kent Owens semi-automatic.

24"x24"x24" Cincinnati crank.
24"x24"x24" Cincinnati crank.
24"x24"x26" Liberty openside.
30"x30"x12" Cleveland openside.
32"x32"x12" Niles.
36"x36"x10" Cincinnati.
36"x36"x12" Gray.
38"x36"x16" Cleveland. 48"x36"x10' Liberty.

PRESSES
No. † Toledo bench OBI.
No. 19 Bliss OBI.
No. 75 Toledo geared. No. 76 Fremont geared. Nos. 55, 56, 56 Toledo. No. 74 Bliss. Nos. 64 & 65 Consolidated. No. 8-7 Zeh & Hahnemann. No. 63 Michigan.

PARTIAL LIST ONLY

No.7 Rockford. No. 94 Consolidated. Nos. PG4 & PG5 Ferracute. Nos. 148 & PG5 Ferracute.
No. 4A Bliss horning.
No. 22½ Consolidated horn.
159 ton Ferracute coining.
690 ton Cleveland coining.
Nos. 14B & 5A Bliss Toggle.
No. 266 Consolidated cam drawing. No. DDG54 Ferracute cam drawing. No. 2 Standard screw. No. 7 Z. & H. Percussion.

PUNCHES
12" tht., 14"x1" Cleveland horis.
12" tht., 14"x1" Long & Alstatter.
24" tht., 4"x4" Ryerson Kling.
71" Frech gang punch.

RIVETERS 20 & 50 ton Ailen pneumatic. 20 ton Hanna pneumatic. Nos. 1\$B,2A,3A,4A &&A High Speed Hammer, type. Nos. 101 & 120 Grant spinners.

SHAPERS 7" Rhodes. 10" McMahon. 16" Cincinnati.

16" Chembatt. 16" Ohio. 24" Gould & Eberhardt. 24" Potter & Johnston.

SHEET METAL 4'x3/16" Niagara shear. 10'x16 ga. Bertsch shear.

No. 1 Gray Sheet Metal cutter.
30"x14 ga. Pettingell rotary shear.
No. 3 RH Magee wirer.
6" tht, 3'.6" Campbell nibbler.
12" tht, 3" Campbell nibbler. THREADERS

Acme 2 spindle. 3" Acme 2 spinoie. 2" Webster & Perks 2 spdl. 1" 1\(\frac{1}{2}\)" & 2" Landis 2 spdl. 1" H. & G. 1\(\frac{1}{2}\)" Geometric. 2" & 3" Acme.

UPSETTERS 9", No. 3 Wat. Farrel SDSS. 1", 14", 4" & 8" Ajax. 14" Acme.

WELDERS

400 amp. Lincoln arc. 35 & 45 KW Federal Butt. 20 KW Federal spot. 47 KVA Winfield spot. 100 KVA Thompson spot.

2000 TOOLS IN STOCK.

SAGINAW, MICHIGAN

LATHES

McCabe 50*-27* Dbl. Spdl. DC MD Schum. & B. 24"x121 gcg; cone drive. Reed 24"x12" 1.c.g.; s.b g.; cone dr. Pond 26"x10" l.e.g.; s.b.g.; cone dr. Schm. & B. 24 x 10 qcg.; cone drive. LeBlond 19 x 101 hd. qcg; belt drive. LeBlond 18 x8 1.c.g.;d.c. mtr.driven. Bradford 18"x8" q.c.g.; belt driven. LeBlond 17 x61 Plain Turning; bd. LeBlood 17 x61 Mfg. Type: belt dr. Bradford 16"x8" hd. q.e.g.; conedr. Chard 16"x81: 60" centers cone drive. Lodge & Shipley 14"x6' lcg; belt dr. Willard 130x61 Semi-qcg, collets. South Bend 9" Workshop Model; md. LeBlond No. 9 Multi-cut; air chk.; md. Streit 24º Pulley lathe; cone dr. Blount | | *x41 Speed lathe: bd.

PLANERS

60"x60"x14" Cincinnati; 2 hds.; b. d., 55"x55"x30" Betts, 2 hds.; d. c. m. d. 48"x36"x10" Gray; 2 hds.; d.c. m. d. 36"x36"x10" Gray; 2 hds.; d.c. m. d. 26"x26"x10" Gray; 2 hds.; a.c. m. d. 26"x26"x6" American, 1 hd.; b. d.

SHAPERS

26ª Walcott Plain Crank; belt drive. 26ª G. & E. b. d.; d. c.; m. d.

24ª Cincinnati, b. g., h. d. cone drive.

24" Gould & E. b.g. V-ram; ACmd. 22" Ohio, b. g., cone drive.

16" Gould & E. b.g. cone drive.

16" Barket pl. crank cone drive. 12" Smith & Mills plain crank, b. d.

J. M. Robinson %'x12'6' heavy duty press brake; double geared; double crank; A-type cast iron end frames; 8%' diameter crankshaft; complete with 25-HP Westinghouse DC driving motor and control. Condition excellent!

BORING MILLS

3½° bar Niles-Bement-Pondhot.; md. 3° bar Rochester horizontal; sp os m.d. 3° bar Foedick horizontal; sp of or md. 3° bar Rockhord horizontal; AC m. d. 4° bar Foedick No. 2-A Floortype ed. Niles 72° Vertical bor. mill; 2 hds. md.

MILLING MACHINES

Cincinnati No. 4, HD plain.; come dr. Cincinnati No. 3 Universal; come drive. Brown & S. No. 2-A Universal; spd. LeBlond No. 3-HD Plain; 3-step c.d. Brown&S. No. 1Y Pla. Miller Come Dr. Brown & S. No. 12 Plain Come Drive. Garvin No. 12 plain Miller; c. d. Becker No. 4B vertical; rot table; bd. MISCELLANEOUS

(2)41/2" Gridley Auto, Ser. Mach. bd. (2)31/4"Gridley Auto, Ser. Mach. b.d.

21/4" Gridley Auto, Scr. Mach. b. d. Bertsch 101x 10ga. Press Brake, m. d. (4) B & S No. 3 26 gear cutters;b.d. Dreses 51 pl. radial; arr. AC or DC. Cinti-Bickford 31/2" Radial; DC MD. Mueller 41 Plain Radial: and gear box. Barnes 3-apin. 221/2" drill;all PF; BD. Rockford 3-apin. 221/2 "drill all PF; BD Foote-Burt 4-spin, HD; power fd, bd. Ohio No. 3 cutter & tool grinder; b. d. Landis 20x96" pl. Cyl. grinder. b. d. No. 2 Diamond surf. grinder, motor dr. Heald No. 72 Hydraulic grinder b. d. B & S 14"x72" Plain Cyl.: b. d. Atkins No. 3 metal band saw; b. d. LeBlond No. I cut. & tool grinder; bd. Landis No. 11/2 universal grinder; b. d. Foote-Burt No. 25 h. d.; drill; spd. Foote-Burt 4-spindle adj. rail; b. d. Avey 6-sp. Sensitive b.d.; belt drive.

THE E. A. KINSEY CO.

333 West Fourth St.,

Est. 1886

Cincinnati, O.

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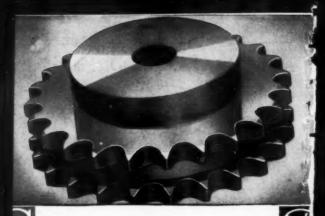
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